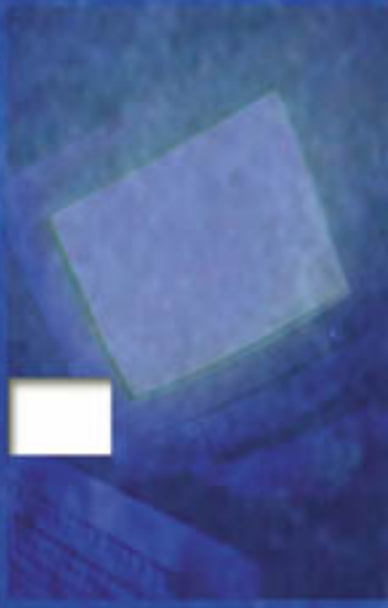
CREATING Web-based TRAINING



A Step-by-Step Guide to Designing Effective E-Learning

Joseph T. Sinclair, Lani W. Sinclair, PhD, and Joseph G. Lansing

Creating Web-Based Training

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A Step-by-Step Guide to Designing Effective E-Learning

Joseph T. Sinclair
Lani Wallin Sinclair, Ph.D.
Joseph G. Lansing

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To my father, Joseph Treble Sinclair, Jr., a professor of geography at Eastern Michigan University, who was a dedicated educator

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Acknowledgments

In the 1980s and early 1990s, many early pioneers in digital multimedia did experiments with training, education, and entertainment, which first found their refined expressions in multimedia presentations on CDs. The Web unexpectedly preempted CDs as a venue for such presentations. Educators, schools, trainers, and training organizations have come a long way since the beginning of Web-based training (WBT) in 1995, but they had a firm foundation on which to build, a foundation laid by the early pioneers in digital multimedia.

At the North Bay Multimedia Association (NBMA) in the San Francisco Bay Area, we first did an experiment running three courses, for tuition, on the Web in 1996. At that time there was very little activity in education on the Web, and we proved that students would pay for education delivered via the Internet. Our offering was crude and certainly wasn't the first, but it was a suc-

cessful early experiment thanks to my fellow members of NBMA who worked on the project.

Many thanks to the early pioneers in digital multimedia and to my fellow members of the NBMA who were a deep resource for learning about and understanding the potential of the multimedia medium that is the Web. My thanks also to my co-authors Lani and Joe who added a corporate prospective to the presentation of education via the Web and contributed practical knowledge that many readers will find useful. My appreciation also to my family Brook and Tommy for their toleration, however strained, of Dad's workaholic activities necessary to writing this book. I also appreciate Lani's support, as a wife, for the time I spent on this book. As always I appreciate the efforts of Carole McClendon, my agent, and the folks at AMACOM, Jacquie Flynn and Mike Sivilli.

Finally, I would like to acknowledge the readers of this book, pioneers too, who will take a few ideas from it and just do something; that is, they will create something useful for students and deliver it to students via the Web. I hope that will be every reader.

Joseph T. Sinclair

As a former teacher and lifelong educator—in both the academic and corporate worlds—delivering training over the Web was not an idea I warmed to naturally. It took a great deal of prodding by my husband and "technical" colleagues to convince me that training on the Web can be an effective way to impart knowledge.

My thanks to my darling husband, Joe Sinclair, and my colleagues, Steve Durgin and John Kasley, for continuing to encourage me in this new way of delivering training. And to my colleague, Sue Hawco, whose tireless dedication and devotion to online learning carried me through my first project, thanks Sue for your encouragement and friendship.

I

Creating Web Pages

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1

Web Pages

Web pages are the stuff of Web-based training (WBT). Web pages are also the stuff of websites. You might conclude that WBT is like a website. Indeed, a WBT presentation works just like a website and could be a website or part of a website. Both WBT and websites are collections of Web pages linked together. A WBT presentation is devoted to training or education. A website presentation can be devoted to almost any purpose. For each, Web pages are the basic building blocks.

Web Pages and WBT

A Web page is the fundamental unit of WBT. It is what people see when they view a WBT presentation. Most often a Web page is composed of simple text and images but may contain other media such as audio or video. Behind the scene of every Web page is Hypertext Markup Language (HTML). The HTML is not displayed for people to see. It does its job unseen, holding the different elements of text and media together and enabling a Web browser to display them as designed. HTML also enables users to move from one Web page to the next through the use of hyperlinks (links).

Your WBT presentation will consist of a collection of Web pages. They will be arranged to convey information in a systematic way, much as information is presented in a training course or in a textbook. Although we don't cover instructional design in this book, there are many excellent resources that will help you to hone your instructional design skills. Just keep in mind that once you have designed your instruction, you develop Web pages to make your WBT.

Technically Speaking

A Web page is an ASCII (American Standard Code for Information Interchange) text file with the added feature of HTML markups. These markups enable a Web browser like Microsoft Internet Explorer or Netscape Communicator (Navigator) to display a Web page in the way its developer intended. A Web developer creates the layout of text, the links, and the images through the use of HTML markups. Markups also serve to enable navigation within and between Web pages through links. The markups are plain text

characters enclosed by angle brackets < > making them easy to spot and read (see the text immediately below).

```
<table width="500"><tr><td>

<div align="center"><h2>Successful
Meetings</h2>

<b>by Joseph G. Lansing</b></div>

<p> Was your last meeting successful?
Were you an effective chairman or an
active participant? Were those who had
a contribution to make invited? Did
the meeting accomplish the stated
purpose? These questions and many more
need to be asked and answered
affirmatively if organizational
meetings are to be successful.</p>

</td></tr></table>
```

Were you to view the Web page above in a plain text editor (e.g., Windows Notepad) or an HTML editor, it would look as it does above. When the browser displays it, however, it looks as it does in Figure 1.1. This is why we say HTML does its work unseen.

Creating attractive Web pages is a simple process. Your text needs only the addition of HTML to prepare it for Web viewing. There are dozens of HTML markups, which provide you the freedom to be highly creative with your Web pages. If you want to learn more, Appendix II provides an HTML tutorial.

But you don't need to learn to use HTML to make Web pages. You can use a Web page authoring program, and Chapters 2–7 show you how do so. If you already know how to create Web pages, you might want to skim Chapters 2–7 just to pick up a few new ideas.

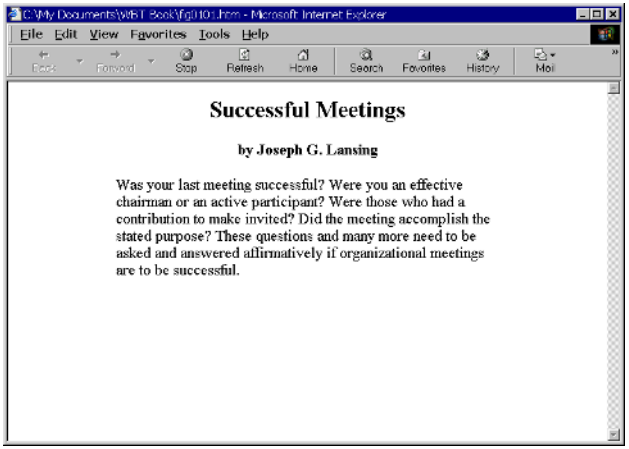
C:\My Documents\vbT Book\fg0101.htm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Successful Meetings
by Joseph G. Lansing
Was your last meeting successful? Were you an effective chairman or an active participant? Were those who had a contribution to make invited? Did the meeting accomplish the stated purpose? These questions and many more need to be asked and answered affirmatively if organizational meetings are to be successful.

Figure 1.1 Successful Meetings Web page as displayed by browser.

Where Do Web Pages Go?

The Web pages that make up your WBT will eventually reside on the hard drive of a network server computer operated by your organization. If you don't have a company or organization intranet, you can easily use a host Internet Service Provider (ISP). In either case the computer will have Web server software that delivers Web pages when people request them (on an intranet or the Internet) via their Web browsers.

Intranet, Internet

Unfortunately, these very similar words mean different things. An *intranet* is the internal network for an organization. The *Internet* is the worldwide network to which all networks are connected. If you're on your organization's network, you're on an intranet, which connects to the Internet. If you use an ISP to connect to the Internet (e.g., dial-up connection), you're on

the ISP's network, which connects to the Internet. Web technology and software works the same whether you're on an intranet or the Internet.

We describe how to upload (publish) your files to an intranet or the Internet in Chapter 8. But you can begin developing WBT on your own computer right away. In fact, it works quite well to develop and test all your Web pages on your computer before you transfer them to a computer with Web server software. Developing WBT on your own computer allows you to change your work (i.e., polish it before your students use it).

Your WBT will consists of files just like any other computer files. They will be HTML files and files for the various media you employ such as images, sound, and video. You create them and save them on your hard disk. When you upload them to a server computer, they will reside on the hard disk of the server computer that runs a Web server.

How Does It All Work?

How do you get your WBT up and running? It's not as hard as you may think, and this book will help you every step of the way.

Create and Test

First, you create and test your Web pages on your own computer. It is important to test your Web pages to make certain they appear as you want them to. Eventually, you will need to test your Web pages with fellow Web developers by passing Web page files around and with student pilot groups by posting your Web pages on the Web.

Upload

After testing, you upload your Web page files to a host computer. The host computer may be your organization's network server computer, or it may belong to an ISP with which you have contracted to host your website. If your WBT will be hosted internally, your organization's network administrator can provide you with the location for your Web pages and the details of the uploading procedure. If you are using an ISP, it furnishes the connection to the Internet and provides a domain name for you to use (or sets up your own domain name). Chapter 8 covers this process in detail.

Host Computer

The host computer (server computer) runs Web server software designed to efficiently manage Web page files. Once your files are uploaded to the host computer, the Web server software serves them so students can access them fast and efficiently.

Most WBT developers don't need to know a lot about Web server software. They can focus on the development of effective WBT presentations and leave Web server know-how to a network administrator or a host ISP.

Naming

People will use your domain name address to find your WBT. Your domain name address is a *universal resource locator* (URL) and is unique. Your designated location, or domain name address, for your Web pages may be a subset of your organization's intranet website. For example, a college may provide some elective classes on their intranet. Their WBT classes are located at the domain name address *http://www.xyzschool.edu/webclass/*. Individual classes would be set up as extensions of this address. An example

might be Sociology 310, for which the URL might be *http://www.xyzschool.edu/webclass/soc310/*.

How will people on the Internet find the URL for your WBT? You will need to make it available through a variety of means. If you want lots of potential students, you will need to submit it to a wide variety of search engines and use advertising, promotion, and publicity. If your WBT is hosted on your organization's intranet, you may want to arrange for appropriate links to be established in other intranet Web pages to provide easy access to and increased visibility for your WBT presentation.

Request

When a student enters your URL into his or her Web browser (or clicks on a link that contains your URL), the browser sends the request for a certain Web page over the Internet to the URL (to the Web server handling your website). The Web server answers the request by sending the requested Web page.

Receives and Views

The student's browser automatically downloads the requested Web page into the student's computer (client computer) and controls it. Once the person's browser has downloaded a Web page, the browser displays it and keeps track of it. The browser also downloads images (or other multimedia elements) that make up a part of the Web page and displays such images in the Web page.

The remainder of the book fills you in on many of the details you need to know in regard to making this process work for you, but the overview of the process itself is straightforward.

Web Pages Everywhere

We have given you two ways of using Web pages. First, we've said you can create and test Web pages on your own computer. Second, we've said you can upload your Web pages to a server computer (running a Web server) on an intranet or the Internet so as to enable others to view your Web pages.

But if you can view your Web pages on your own computer without a Web server, other people can do the same. They can view your Web pages without a Web server if you deliver the Web pages offline.

Focus

The book will focus on publication of WBT presentations via intranets and the Internet. It may be useful, however, for you to understand that you can distribute Web pages to whoever has a Web browser via means other than an intranet or the Internet.

Distribution

Because everyone can view Web pages on their own computer, you can distribute a WBT presentation on a floppy disk, a CD, a hard disk, or any other common means of digital storage. An individual can use his or her Web browser to view your WBT presentation on the storage medium (e.g., floppy disk).

This points out two things to keep in mind. First, an intranet or the Internet are not the only means of distributing a WBT presentation (or a website). For example, you can send it on a CD instead. Second, an individual does not need anything except a Web browser (the universal software) to view your WBT presentation.

Another way to distribute Web pages is via email. Just attach the HTML files and send them with an email message. Everyone has a Web browser and can view your Web pages sent in such a manner.

Presentation

Can you present a website? With your laptop PC and a computer projector, you can show Web pages on the screen. The Web pages can be on a floppy disk or a CD; you don't have to be connected to an intranet or the Internet. Consequently, you can use a WBT presentation in a classroom via a projector. It's a great substitute for PowerPoint. Why use PowerPoint for anything when you can use Web pages instead? You can post your WBT presentation on the Internet and project it on the screen in a classroom too.

Summary

Web pages are the basic building blocks of both websites and WBT. Indeed, a WBT is like a website, albeit a special kind of website. Consequently, to kick off the book we start with an explaination of Web pages and move directly to creating Web pages covered in the next couple of chapters.

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2

Creating a Web Page

If you have never created a Web page, this chapter and the following chapters through Chapter 7 will give you a good start. Chapter 1 provided some background on Web pages. Now you will get started actually creating Web pages. We encourage you to begin with our examples to make building your expertise as easy as possible. However, if you have your own content you want to use, that might work too. We have included a WBT tutorial entitled *How to Make Meetings Successful*. It's on the CD that accompanies this

book. The Parts of the Meetings tutorial provides the basis for exercises found in these initial chapters and throughout the book.

Authoring Software

Authoring software is software you can use to lay out the text, links, images, and other media such as sound or video in your Web pages. This software is very easy to use. So easy, in fact, that if you can use a word processor, you can easily use a Web authoring program. Authoring software allows you to work in a WYSIWYG (what you see is what you get) environment. In other words, you can forget about all the HTML markups necessary to lay out a Web page!

Getting the appropriate software and installing it is the next step in developing Web pages. The question is, What should you use? Your organization may have advanced Web authoring software, such as HomeSite (*http://www.allaire.com*) or HoTMetaL Pro (*http://www.sq.com*). If so, great! You might be able to use the WYSIWYG view of such software profitably with this book. But in this chapter we start with basic authoring software. If you learn Web page development using a simple program, you will gain a solid foundation as a Web developer. Beginning with basic authoring software also speeds the learning process by avoiding the more complex features found in advanced software. (Chapter 20 covers a variety of advanced authoring software.)

The easiest, fastest, and least expensive way to get started is to use one of the free authoring programs widely available on the Web. Specifically, this book features Netscape Composer 6.0 or Microsoft FrontPage Express 2.0. All exercises in this book are based upon these two programs. Both are free programs and come with their respective browsers.

Similar

Just like word processors are similar, Web authoring programs are similar. In fact, Web authoring programs are very much like word processors. If you don't like Composer or FrontPage Express, you can use something else such as HomeSite.

Netscape Composer

Netscape Composer is available for the PC and Mac and can be found at the Netscape website (*http://www.netscape.com*). Composer is one component of the Netscape Communicator 6.0 package. Netscape's download process begins with the download of a small executable file. Select a suitable temporary location for this file. After it has completely downloaded to your hard disk, double click on the file to begin the full download and installation. Netscape provides instructions for the process for you to read.

Netscape 6.0 has an optional step in the installation process called "Activation." This feature will register you as a user of Netscape 6.0 and install additional features like Web mail, instant messaging, and a scheduling calendar. This step is not required, and you can select *Cancel* to avoid installing the extras.

Initially Composer cannot be started independently from the Netscape browser. Use the Composer icon at the bottom left corner of the browser. Once installed, you can edit preferences to have both the browser and Composer start when you click the Netscape icon. You can also elect to start Composer without the browser, but because you will be using the browser to test your Web pages, we don't recommend this.

Microsoft FrontPage Express

Microsoft FrontPage Express is available only for the PC and only at Microsoft's website (*http://www.microsoft.com*). Actually, it's quite similar to Composer and works much the same way. One significant difference is that you launch it separately from the browser. You can obtain FrontPage Express free by downloading it with the Microsoft browser.

FrontPage

Don't confuse FrontPage Express with FrontPage. FrontPage is Microsoft's website-building software and is not free. It is included with certain versions of Microsoft Office (Microsoft's office software suite), or you can purchase it separately.

The version of FrontPage Express available free with the Microsoft browser is similar not only to the prior version of FrontPage Express but also to FrontPage Editor, the Web authoring program that's a part of older versions of FrontPage (see Figures 2.1 and 2.2). FrontPage 2000 does not have a stand-alone editor.

Consequently, if you happen to have a copy of FrontPage (other than FrontPage 2000), you can probably comfortably use FrontPage Editor in place of FrontPage Express for the purposes of this book. But you can even use FrontPage 2000. It's a Web authoring program with a WYSIWYG view. (It's a website development program too.) It's also similar to FrontPage Express. Thus you have some choices. Although they won't necessarily follow the step-by-step instruction in this book exactly, these programs are easy to use.

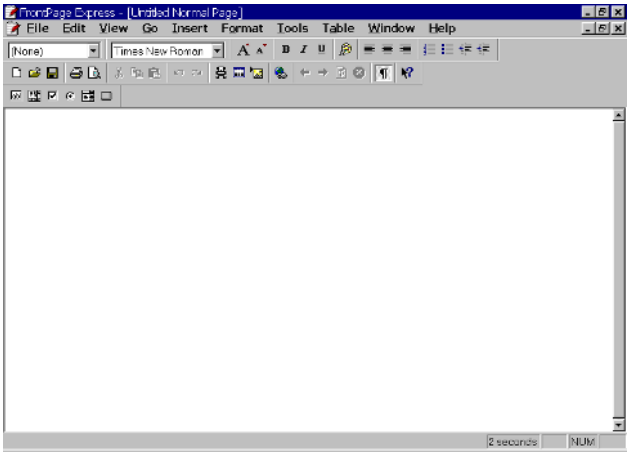


Figure 2.1 FrontPage Express, the Web authoring program.

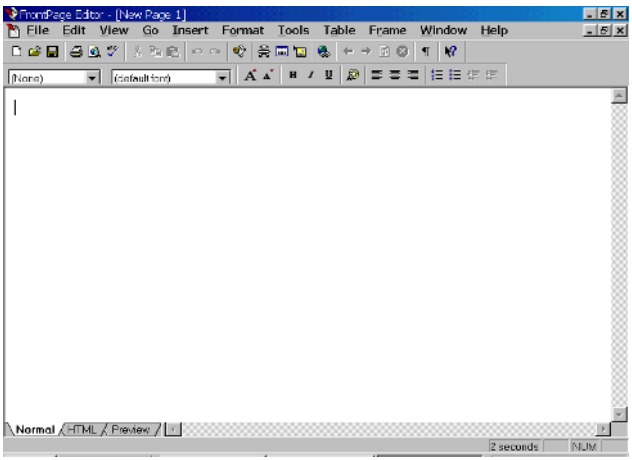


Figure 2.2 FrontPage Editor, the Web authoring program that's a part of FrontPage (the website building program).

Late Breaking News

As this book went to press, FrontPage Express seems to have quietly disappeared from Microsoft's website. After several extensive tries, we can no longer find it. It may no longer be available. If you cannot find it and you don't want to use Netscape Composer, we recommend you use HomeSite (*http://www.allaire.com*) instead. It works similarly to FrontPage Express and Composer. Although HomeSite comes with a price, it does offer a 60-day trial version that will get you through the book without making a purchase. HomeSite also comes bundled with Macromedia Dreamweaver, the best combination of Web authoring and website development programs available.

In HomeSite, use the Design view for a WYSIWYG authoring environment. You can also use the Edit view for HTML editing if you know HTML.

From the Web to Your Computer

For the purposes of this book, we assume you can browse the Web, find the appropriate download site, and download the necessary files. Both Netscape and Microsoft change their download and install procedures from time to time. Make certain that you follow all instructions carefully. You may even wish to print the Web page with the instructions for reference during your download and installation.

If your organization restricts what software can be installed on your computer, make certain you talk with your network administrator or the appropriate computer support people about your needs. A quick review by skilled support personnel will reveal that these authoring programs are solid and dependable.

If you cannot obtain these programs or desire not to use them, look for a Web authoring program with a WYSIWYG view on a shareware website (e.g., *http://cnet.com*, Downloads).

Time to Start

Chapter 1 explained that you can build your WBT presentations entirely on your own computer. So, to begin, you need to set up a folder to hold your work. Naming it *1wbtwork* ensures that it appears towards the top of your folder tree and makes it quick to locate.

Text for Tutorials

Use the following text for the Composer and FrontPage Express tutorials that follow in later sections:

> First State Commercial Bank
>
> Instructions
>
> This Web-Based Training will help make your meetings successful. As you read through this helpful tutorial, click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
>
> Successful Meetings Begin Here
>
> Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a successful meeting generates effective actions after the meeting concludes. Participants leave with a clear understanding of the information presented and decisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants follow up on work assignments from the meeting. Thus, a successful meeting requires important steps to be taken before, during, and after the meeting session.

Using Netscape Composer

Open the Netscape Navigator 6.0 browser. You will see five icons at the left-hand bottom. Click the one that looks like a pen.

Composer will start with a fresh new Web page ready to go. You should see the cursor in the upper left-hand corner. Using the segment of the Meetings WBT tutorial provided earlier, begin typing in Composer. It will appear just as in Figure 2.3. You have just typed your first Web page. Remember that you can use the copy and paste functions if your text already exists in digital format (e.g., word processor file). This can be a great time saver.

This is the humble beginning to your WBT presentation. Upcoming chapters will show you how to make this Web page look professional with normal formatting and how to add media to help

engage your students. But the next step now is to save your work (see Figures 2.4 and 2.5).

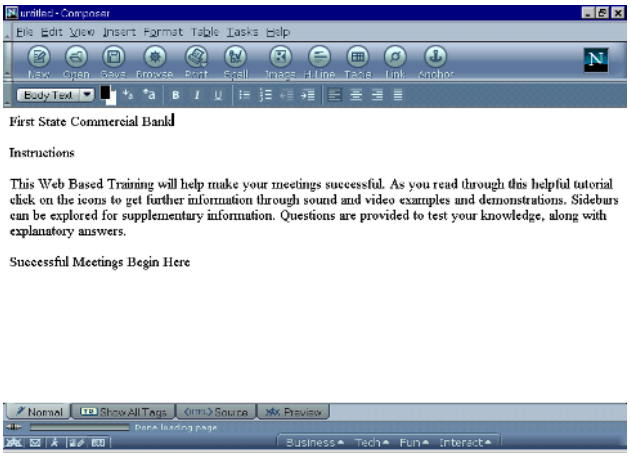

untitled - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image H.Line Table Link Anchor
Body Text
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Normal
Show All Tags
Source
Preview
Done loading page
Business
Tech
Fun
Interact

Figure 2.3 Typing text into Composer.

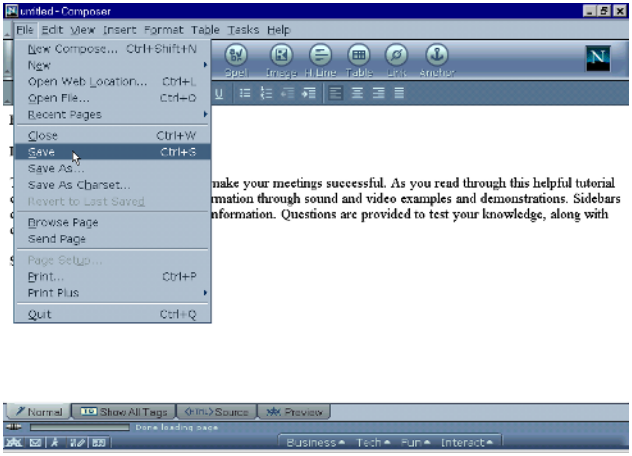


Figure 2.4 Go File, *Save* to save the new Web page.

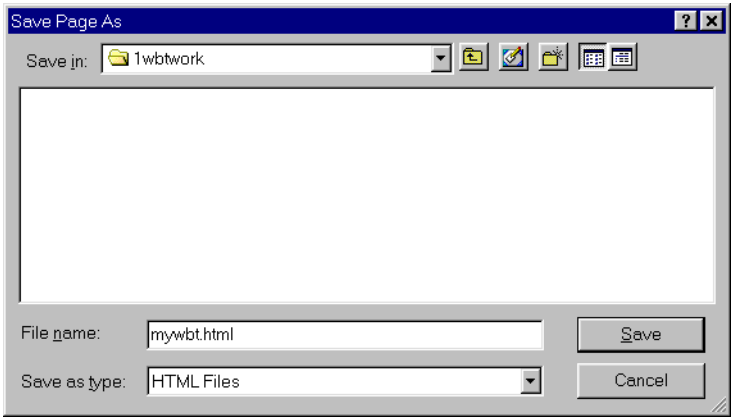


Figure 2.5 Name the new Web page *mywbt.html*.

Remember to save your file in the folder you set up named *1wbtwork*.

Using FrontPage Express

FrontPage Express is similar to Composer and can lay out a Web page just as easily. But the details remain important. So the book in many cases provides additional separate instructions for FrontPage Express.

Don't Read

If you use Composer, you won't want to read the FrontPage Express sections. They're mostly the same. Likewise, if you use FrontPage Express, you won't want to read the Composer sections.

Open FrontPage Express 2.0 by clicking on the application icon.

Using the segment of the Meetings WBT tutorial provided earlier, begin typing in FrontPage Express. It will appear just as in Figure 2.6.

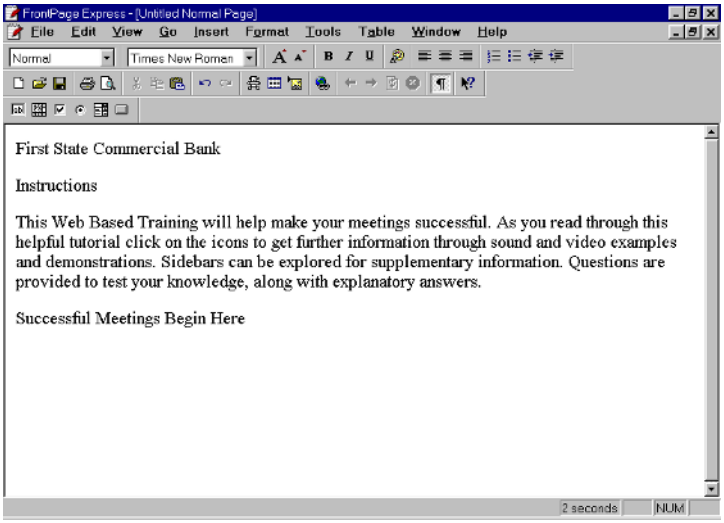

FrontPage Express - [Untitled Normal Page]
File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
2 seconds
NUM

Figure 2.6 Typing text into FrontPage Express.

You have just typed your first Web page. Remember that you can use the copy and paste functions if your text already exists in digital format. Chances are that much of your material for a WBT presentation may exist as word processor files. This can be a great time saver, and you should use such digital files whenever possible.

This is the humble beginning to your WBT presentation. Upcoming chapters will show you how to make this Web page look professional with normal formatting and how to add media to help engage your students. But the next step now is to save your work (see Figures 2.7 and 2.8).

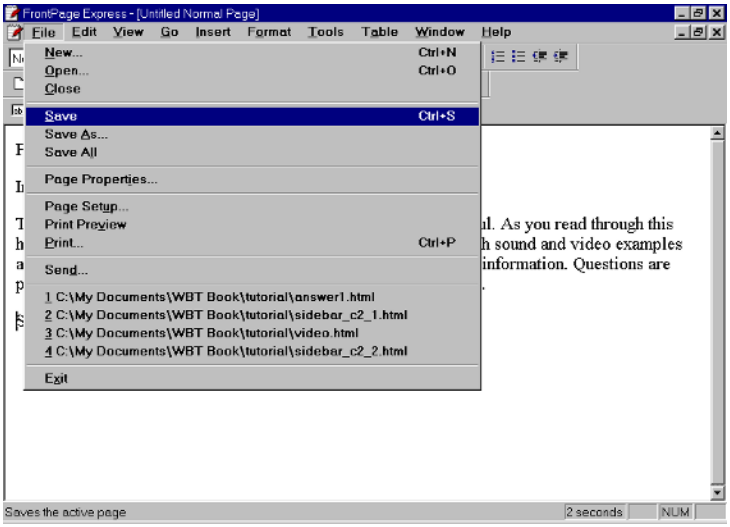


Figure 2.7 Go *File*, *Save* to save the new Web page.

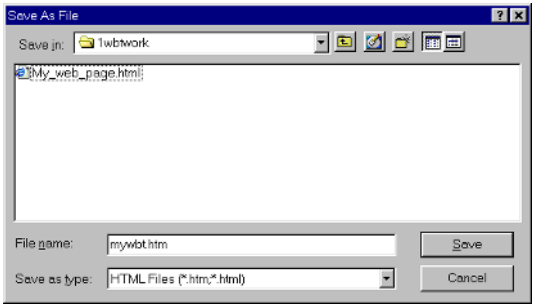


Figure 2.8 Name the new Web page *mywbt.html*.

Remember to save your file in the folder you set up named *1wbtwork*.

Testing Your Work

Both Composer and FrontPage Express display your Web pages much as the end user will see them. Remember, they enable you to work in a WYSIWYG environment. Even though this is the case, it is important to test your work by viewing it in a browser. There are subtle differences in the way a Web page will look in a browser compared to authoring software.

Testing is easy and should be a regular part of your work developing Web pages. The steps are:

1. Open your authoring program.
2. Open the Web page in your authoring program.
3. Open your Browser.
4. Open the Web page in your browser.
5. Work on the Web page in your authoring program and then save it.
6. Refresh the Web page in your browser and look at it.

The last step—refresh—is critical, but easy to forget. Always remember to refresh the browser in order to see the latest saved version of the Web page. It can be frustrating to make changes in the Web page via the authoring program and not see your results in the browser when you forget to refresh.

Browsers

Just a reminder that Web browsers are available free. Go to the Netscape website (http://netscape.com) and download Netscape Navigator. Or, go to the Microsoft website (http://microsoft.com) and download Internet Explorer. And there's a new kid on the block. Try the Opera browser. Go to the Opera website (http://opera.com) and download the Opera Browser.

It's cool. It's also a serious competitor to the long existing browsers.

Although we use all three browsers for illustrations in this book, we are particularly intrigued by the Opera browser. It claims to meet all open Web standards (Netscape and Microsoft do not). Thus, if your Web page works in Opera, presumably it meets the standards, and everyone will be able to see it. We don't have much experience with Opera yet, but it promises to be a great browser for Web developers to use for testing purposes.

Getting the Right Look

There are some considerations to keep in mind when you start creating your WBT presentations. People use three resolutions (measured in pixels) on their computer monitors: 640 × 480, 800 × 600, and 1024 × 768. You want to make your text easy to read at all these resolutions, and you want to prevent the browser from displaying a horizontal scrollbar. Horizontal scrollbars can be quite distracting and are simply a mechanism the browser uses to compensate for a poorly designed Web Page. Note in Figure 2.9 that the text is abruptly cut off at the right side.

The easy way to make text readable at all resolutions is to place all your text inside an invisible table that is less than 640 pixels wide. A table can be rendered invisible to students by setting the border to equal 0. To provide maximum readability, your column width should be 480–520 pixels wide. This assumes you are using the default 12-point Times New Roman (or Times for Mac) font. A width of 520 pixels will also fit inside the WebTV display.

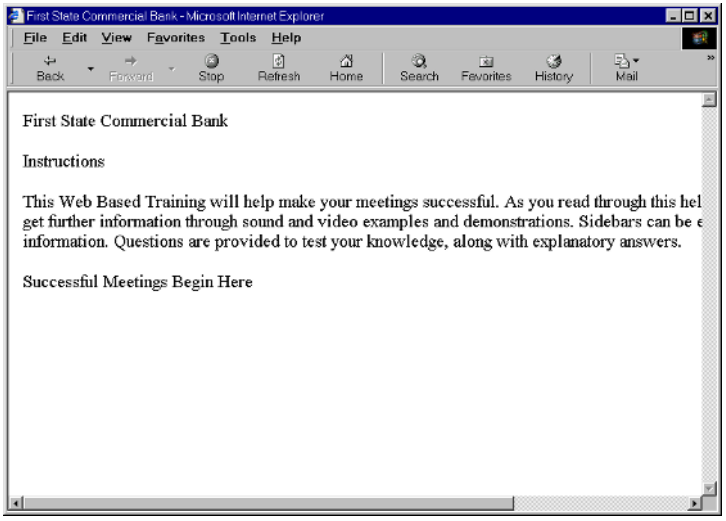

First State Commercial Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this hel
get further information through sound and video examples and demonstrations. Sidebars can be e
information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here

Figure 2.9 Horizontal scrollbar in browser at 800x600 for a text column too wide to be read at less than 1024x768.

Making a Table in Composer

Open your file *mywbt.html* in Composer. Scroll down and place the cursor below the text. Go *Table*, *Insert*, *Table* or click on the table icon.

The Insert Table window will open. Since you need a one-row, one-column table, set the Number of rows to *1*, Number of columns to *1*, the Table width to *500*, the Border to *0*, and click *OK* (see Figure 2.10).

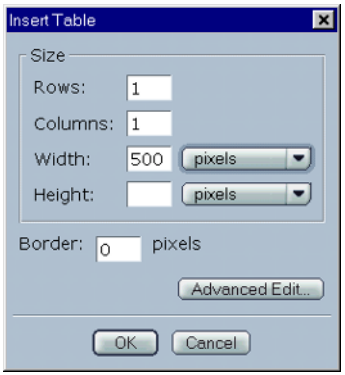


Figure 2.10 Insert Table window.

Your new table is one line high and 500 pixels wide (see Figure 2.11).

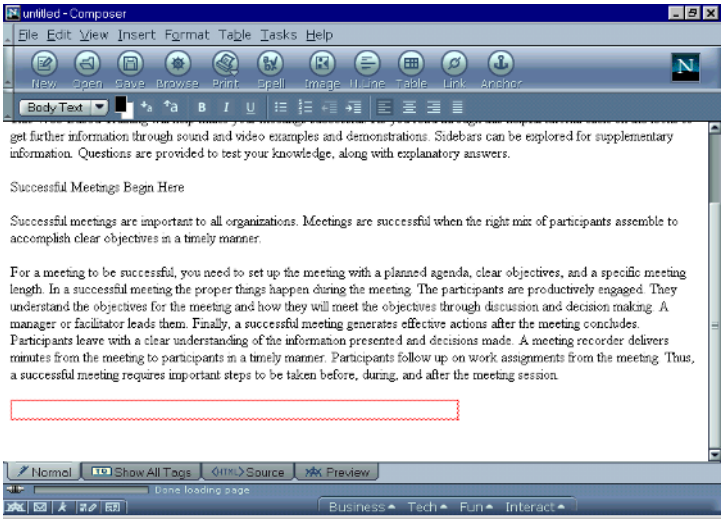

untitled - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image HLine Table Link Anchor
Body Text
get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a successful meeting generates effective actions after the meeting concludes. Participants leave with a clear understanding of the information presented and decisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants follow up on work assignments from the meeting. Thus, a successful meeting requires important steps to be taken before, during, and after the meeting session.
Normal Show All Tags Source Preview
Done loading page
Business Tech Fun Interact

Figure 2.11 New table.

Adjusting the Table

To adjust your table to display text properly, you will need to change its properties. Place the cursor in the table and go *Table*, *Table Properties*. The Tables Properties window will open. Under Table Alignment choose *Center*. Under Borders and Spacing enter *0* (pixels) for Spacing and *10* (pixels) for Padding. Enter *0* for Border Size to prevent the border from displaying in the browser. Click the *OK* button.

Placing the Text in the Table

First highlight the first two headings and first paragraph of the text and cut it (using cut and paste; see Figure 2.12).

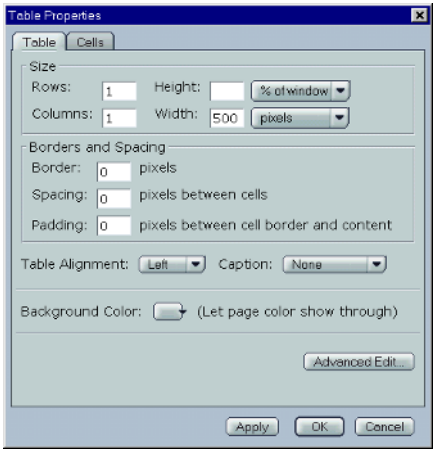


Figure 2.12 Table Properties window.

Paste the text into the table. Now the text is in a column 500 pixels wide (see Figure 2.13).

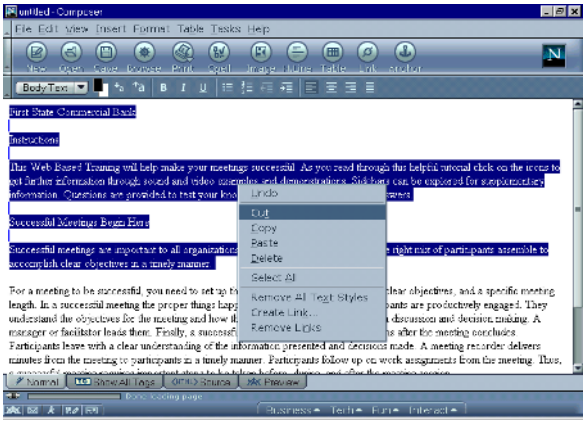


Figure 2.13 Highlighted text.

Any browser can display this text in any resolution without the need for a horizontal scroll bar, that is, all the text will be immediately viewable. (This assumes that a browser is opened to full screen.) Now, test it with your browser (see Figure 2.14).

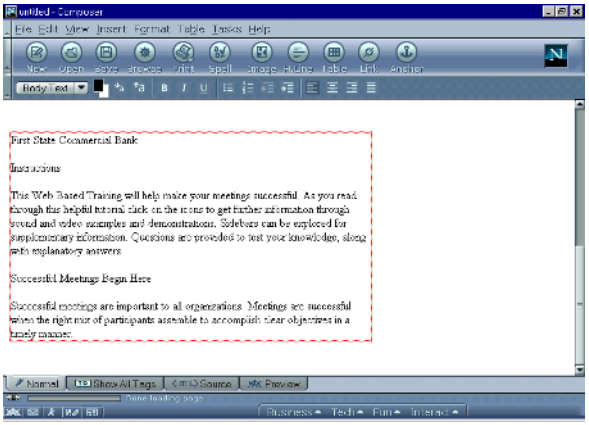

untitled - Composer
File Edit View Insert Format Table Tasks Help
Body Text
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
Normal
Show All Tags
HTML Source
Preview

Figure 2.14 Text after being pasted into the table.

The Web page now looks like a column meant for reading. It shows in a fixed width with a margin on each side. If you were to take a quick tour around the Web, you would find that many websites display Web pages using a fixed-width layout. There may be images, links, or other peripheral content in the margins, but the primary content is in a readable column.

This table is in the center of the Web page. Your individual design needs may lead you to place it on the left-hand side of the Web page or on the right-hand side. You do so by simply changing the alignment of the table in Table Properties.

Typeset the Headings

It is important to typeset the headings for a professional look. Put the cursor at the start of the first heading (First State Commercial Bank). Go to the HTML formatting menu just under the New icon.

Click on the arrow to view the options. Select *Heading 3*. The heading will now appear in a larger than normal size with bold type and a line space before and after. This is an HTML heading level 3. Repeat for the other heading. Test with your browser (see Figure 2.15).

Changing the Type Size

You can learn what type size works best with a bit of experimenting. To change the font size in Composer, highlight all the text and click the smaller font size or bigger font size buttons. These are found in the Format toolbar.

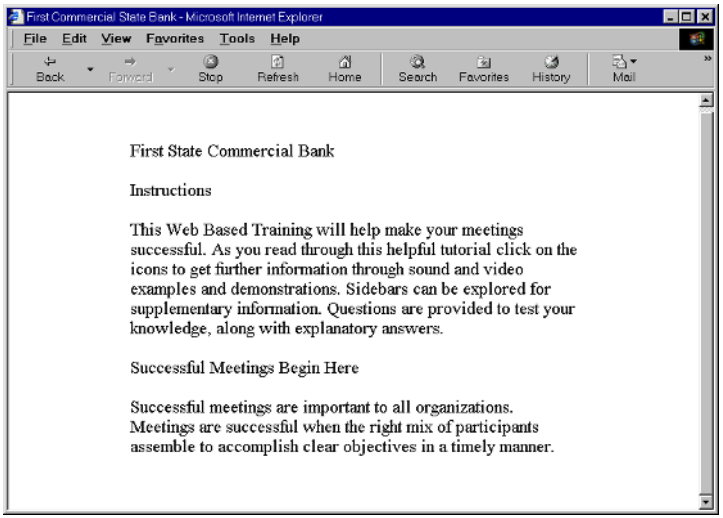

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 2.15 Text with headings.

When you reduce the text (font) size one increment, the column width of 500 pixels may be too wide. Change the width so that it displays the text with 9 to 12 words on each line. Try 400 pixels (see Figure 2.16).

Likewise, if you make the font size larger, you need to expand the width of the column for maximum readability.

Making a Table in FrontPage Express

Open your file *mywbt.html* in FrontPage Express. Scroll down and place the cursor below the text. Go *Table*, *Insert Table*. The Insert Table window will open. Since you need a one-row, one-column table, set the Rows to *1*, Columns to *1*, the Border Size to *0*, the Specify width to *500* (pixels), and click *OK* (see Figure 2.17).

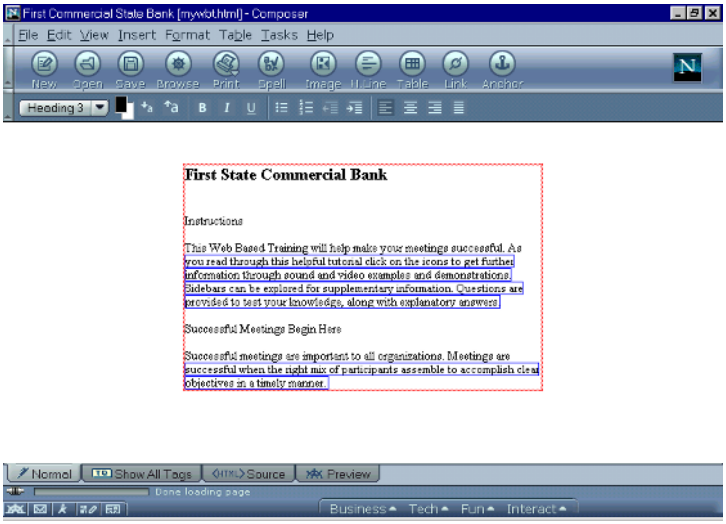

First Commercial State Bank [mywbt.html] - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image HLine Table Link Anchor
Heading 3
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
Normal
Show All Tags
Source
Preview
Done loading page
Business
Tech
Fun
Interact

Figure 2.16 Text column 400 pixels wide with smaller font.

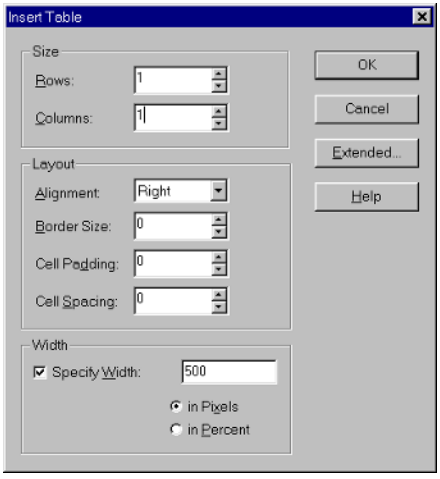


Figure 2.17 Insert Table window.

Your new table is one line high and 500 pixels wide (see Figure 2.18).

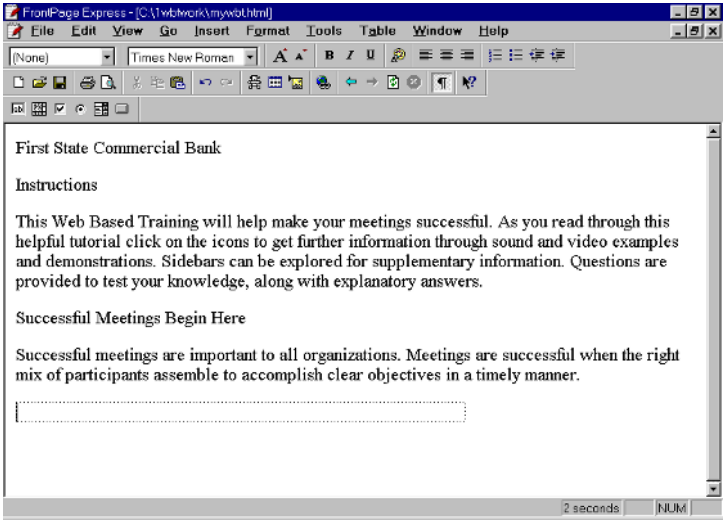

FrontPage Express - [C:\1wbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
2 seconds
NUM

Figure 2.18 New table.

Alternative

An alternative is to click on the table icon and select the uppermost left cell. Then go *Table, Table Properties*. The Tables Properties window will open. Set the table parameters.

Adjusting the New Table

To adjust your table for adding text, you will need to change its properties. Place the cursor in the table and go *Table*, *Table* Properties. This opens the Tables Properties window. Under Alignment choose *Center*. Under *Layout* enter *0* (pixels) for *Cell Spacing* and *10* (pixels) for *Cell Padding*. Enter *0* for *Border Size* so the border won't display in the browser. Click the *OK* button.

Placing the Text in the New Table

First highlight the first two headings and first paragraph of the text and cut it (using cut and paste - see Figure 2.19).

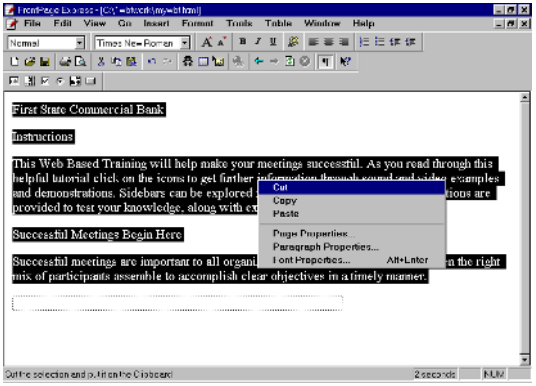

File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further
and demonstrations. Sidebars can be explored
provided to test your knowledge, along with ex
Successful Meetings Begin Here
Successful meetings are important to all organi
mix of participants assemble to accomplish clear objectives in a timely manner.
Cut
Copy
Paste
Page Properties...
Paragraph Properties...
Font Properties... Alt+Enter
2 seconds
NUM

Figure 2.19 Highlighted text.

Paste the text into the table. Now the text is in a column 500 pixels wide (see Figure 2.20).

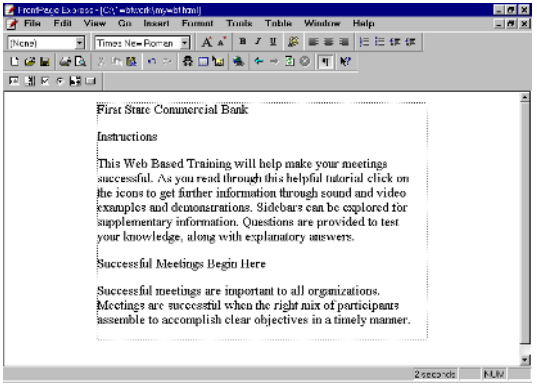

File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
2 seconds
NUM

Figure 2.20 Text in the table.

Any browser can display it in any resolution without the need for a horizontal scroll bar; that is, all the text will be immediately viewable. (This assumes that a browser is opened to full screen.) Now, test it with your browser (see Figure 2.21).

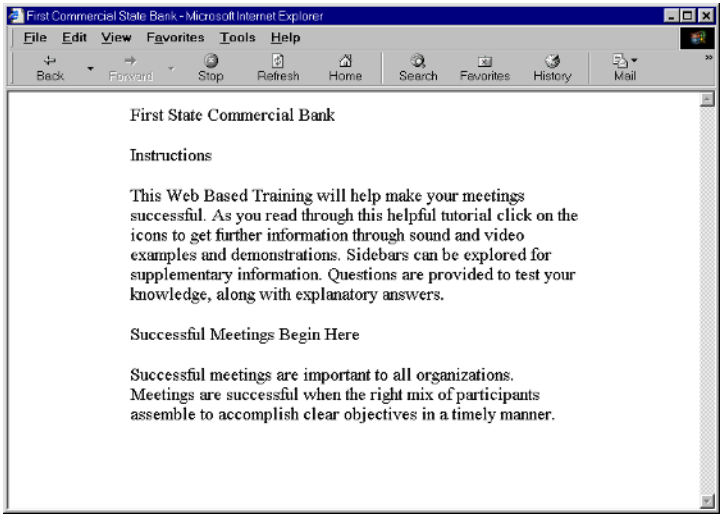

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 2.21 The text column in a browser.

The Web page looks like a column meant for reading. It shows in a fixed width with a margin on each side. If you were to take a quick tour around the Web, you would find many websites display Web pages using a fixed-width layout. There may be images, links, or other peripheral content in the margins, but the primary content is in a readable column.

This table is in the center of the Web page. Your individual design needs may lead you to place it on the left-hand side of the Web page or on the right-hand side. You do so by simply changing the alignment of the table.

Typeset the Headings

It is important to typeset the headings for a professional look. Put the cursor at the start of first heading (First State Commercial Bank). Go to the HTML formatting window just under the File menu.

It will show *Normal*. Click on the arrow, and a menu will drop down. Select *Heading 3*. The heading will now appear in a larger than normal size with bold type and a line space before and after. This is an HTML heading level 3. Repeat for the other heading. Test with your browser (see Figure 2.22).

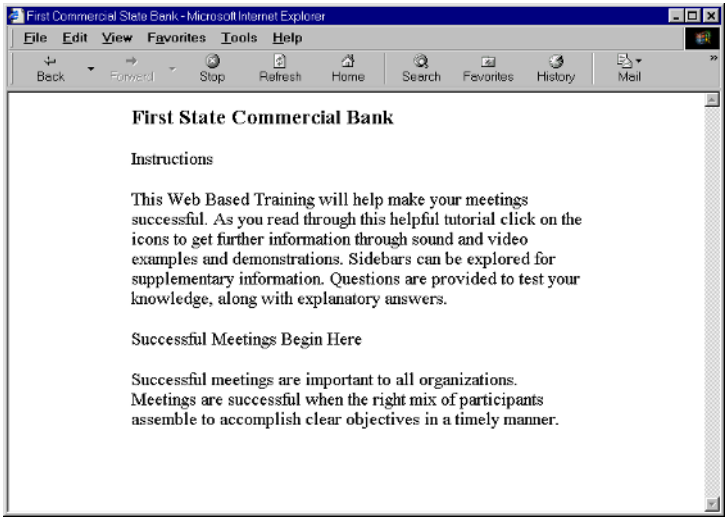

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 2.22 Text with headings.

Changing the Font Size

You can learn what type size works best with a bit of experimenting. To change the font size in FrontPage Express, highlight all the text and click on the decrease font button.

The type size will decrease one increment (see Figure 2.23).

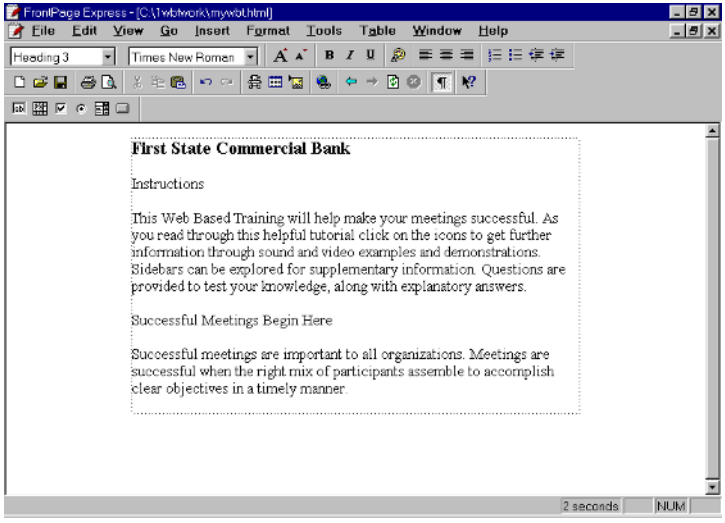

FrontPage Express - [C:\1webwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
Heading 3
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
2 seconds
NUM

Figure 2.23 Decreased type size.

When you reduce the text (font) size one increment, the column width of 500 pixels may be too wide. Change the width so that it displays the text with 9 to 12 words on each line. Try 400 pixels (see Figure 2.24).

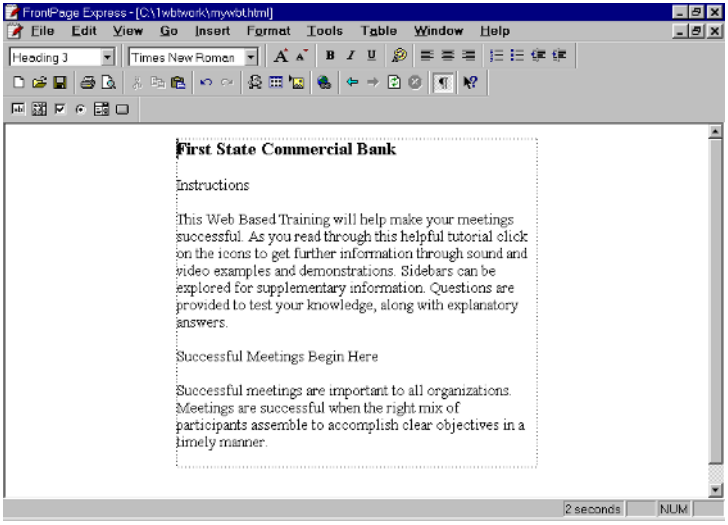

FrontPage Express - [C:\1wbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
Heading 3
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
2 seconds
NUM

Figure 2.24 Text column 400 pixels wide with smaller font.

Likewise, if you make the font size larger, you need to expand the width of the column for maximum readability.

More Practice

For the Meetings WBT presentation, it makes good design sense to have the instructions stand separate from the information on successful meetings. This can be accomplished by placing the instructions in the separate table (you've already done) and using different background colors for the table and the Web page. Chapter 6 explains this in detail. To finish this exercise, however, we need to place the content in a second table below the instructions.

Move your cursor to the lowest point on the Web page. Enter a *Return* to provide space between the tables. Repeat the steps to

insert a one-cell table 500 pixels wide. Copy the text from the third heading (Successful Meetings Start Here) to the ending paragraph (i.e., the content). Paste it in the new table and typeset the heading as you did in the previous table (see Figure 2.25).

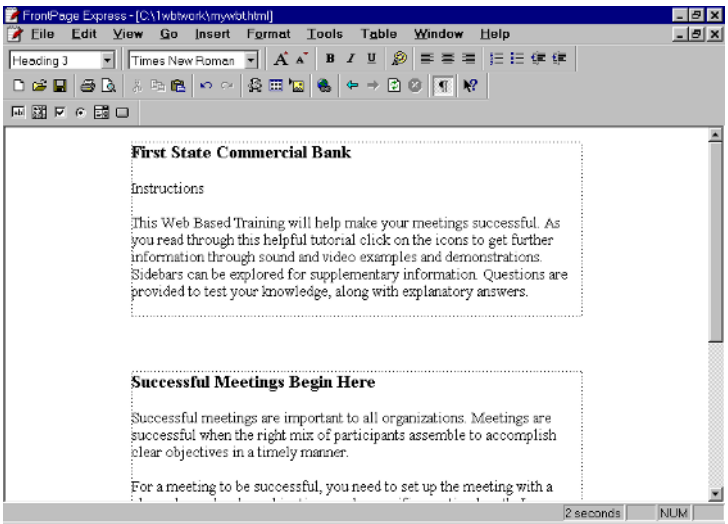

FrontPage Express - [C:\1wbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
Heading 3
Times New Roman
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a
2 seconds
NUM

Figure 2.25 The content of the WBT in the Web page.

You now have the instructions in one table and the content in another. This will enable you to treat the instructions column differently than you treat the content column.

Summary

Creating a Web page is easy with a Web authoring program. You simply open the program and start typing. With the use of a table, you can easily create a text column for an attractive presentation and smooth reading.

3

Adding Images

Images add great value to your WBT presentations. It's hard to imagine a modern textbook or a good training manual without illustrations, and this holds true for WBT presentations as well.

Images can take various forms but always need to be in either JPEG format (*.jpg* file extension for the PC) or GIF format (*.gif* file extension for the PC). You may have access to clip art or other images that are not in these formats. Don't discard the idea of

using them! Chapter 6 shows you how to convert them to the desired format.

Images can come from a variety of sources. Some common sources are:

Scanned images

Clip art

Digital photographs

Text art

Digital art

Web page trimmings

Scanned images are generated through the use of a flatbed scanner. If you own or have access to a scanner, you have access to any material that is in print, provided you have rights to use it. If you have printed training materials, you can digitize them with a scanner for use with WBT presentations.

Digital clip art collections are available on CDs. Check your local computer store or search the Web. You can easily find clip art specific to a particular field of study, occupation, or other area of interest. The cost for clip art CDs can be quite low, and these provide a valuable tool for WBT development. You can also find clip art on the Web. Make sure the clip art images are bitmaps (not vector graphics).

Digital photographs can be scanned photographs, or you can use a digital camera to capture images. There are also extensive collections of royalty-free photographs commercially available on CDs.

Digital Cameras

The price of consumer digital cameras has dropped dramatically in recent years, and quality has risen. It is now reasonable

to expect to get images of suitable quality for WBT presentations with these cameras.

Text art is generated in an image editor that has a text feature. There will be times you want text that has more artistic appeal than simple HTML, such as a drop shadow or three-dimensional appearance. This is quite easy to do, and Chapter 6 shows you how.

Digital art created by a digital artist can enhance a WBT presentation to make it aesthetically pleasing. This is a nice touch if you have the budget for it.

Web page trimmings consist of the graphical elements that go into the design of a Web page. They are the artistic color components that make a Web page attractive.

Prepare Your Workplace

Your image, sound, and video files are collectively known as media files. Because you will be using all three media, you need to make certain you keep them where you can find them. A good way to do this is to create a subfolder named *media* to your folder named *1mywbt.* This is where you can keep all your images for your WBT. Later on you can add sound and video files.

To complete the exercises in this chapter you will need the image files from the CD. On the CD look for the *media* subfolder to the *1myweb* folder and copy all the image files thereon to your *media* folder.

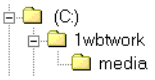


Image Layout with Composer

Open Composer and look at the *mywbt.html* Web page. Find an appropriate location to place (embed) the title image in the Web page. In this case it should be in the first table above the heading "First State National Bank." Move your cursor to this point and press *Enter* once. Then position the cursor at the very top of the table. Click on the image icon.

The Image Properties window will open. Under Image Information enter the URL, which is the path and file name of the image. In this case it is *media/title.gif*. Composer will prompt you to enter text in the Alternative Text field if it is left blank. Type "Successful Meetings" in the Alternative Text field. Alternative text appears when people have elected not to view images with their browser (see Figure 3.1).

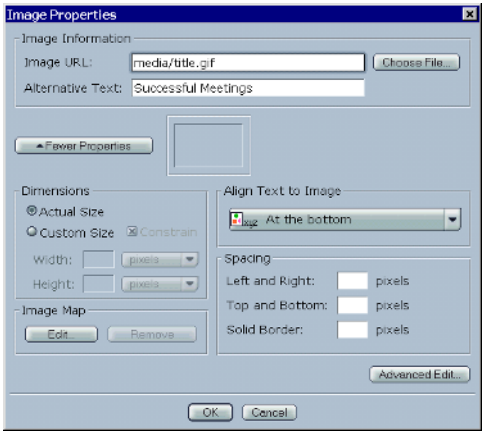


Figure 3.1 Image Properties window.

Click *OK,* then save and test with your browser (see Figure 3.2).

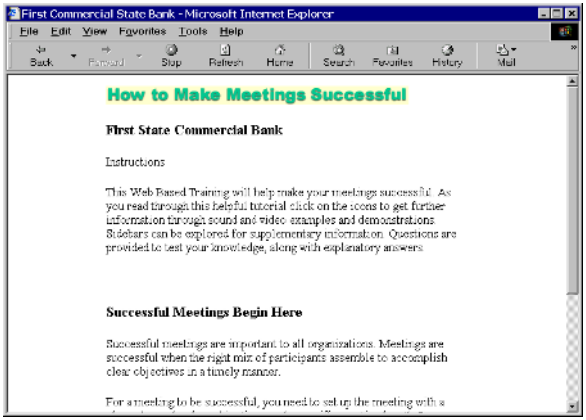

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 3.2 Image in Web page.

The title image looks good but is a little too close to the first heading. Position your cursor at the beginning of the heading and press the *Enter* key. This provides a little space between the two and looks much better. Now test it with your browser (see Figure 3.3).

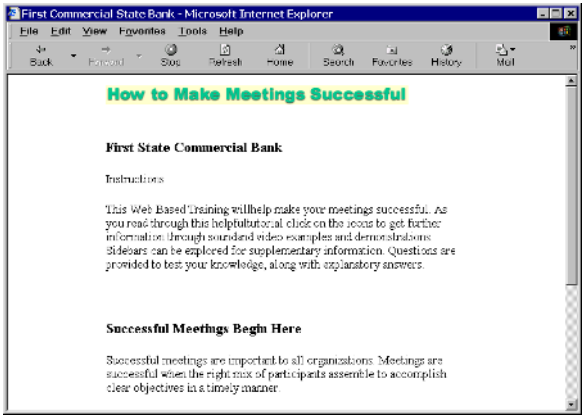

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training willhelp make your meetings successful. As you read through this helpfultutorial click on the icons to get further information through soundand video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 3.3 Image spaced correctly.

Images can serve as icons or buttons as well as illustrations. Your Meetings WBT presentation uses small images (12 x 12 pixels) as icons that serve as links to further information. Note the images in the legend just below the instructions. (see Figure 3.4).

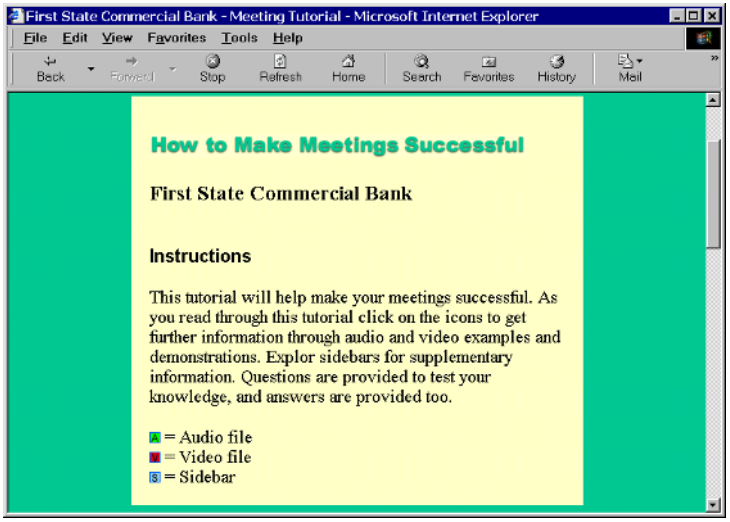

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
How to Make Meetings Successful
First State Commercial Bank
Instructions
This tutorial will help make your meetings successful. As you read through this tutorial click on the icons to get further information through audio and video examples and demonstrations. Explor sidebars for supplementary information. Questions are provided to test your knowledge, and answers are provided too.
A = Audio file
V = Video file
S = Sidebar

Figure 3.4 Tutorial instructions and legend in browser.

Move your cursor to the end of the last sentence in the instructions. Press the *Enter* key to provide some blank space. Place the icon images for the legend on three separate lines. Enter the appropriate text as shown in Figure 3.4 to indicate the meaning of each icon.

Sound icon file – audio12.gif

Video icon file – video12.gif

Sidebar icon file – sidebar12.gif

Save and test in the browser.

Improving the Look

The title image and the icon images need to stand alone and are not placed in the body of a paragraph. When images are used as illustrations, you may want to place them in the text close to the point or concept to be illustrated. In this case, the image depicts before, during, and after (see Figure 3.5).

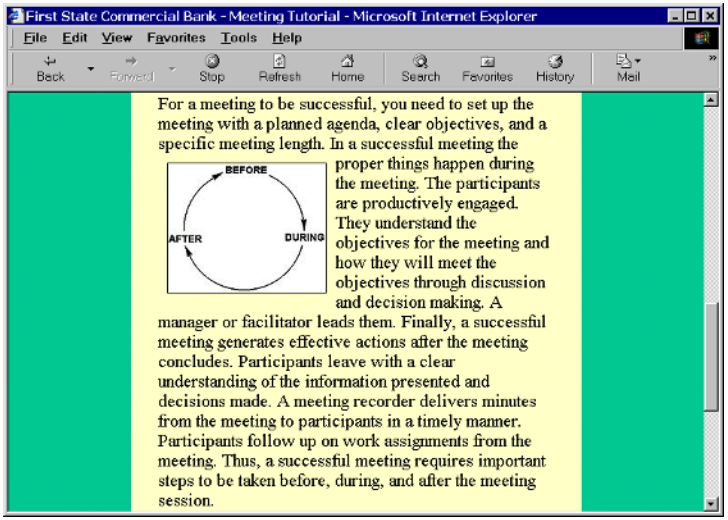

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the
BEFORE
AFTER
DURING
proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a successful meeting generates effective actions after the meeting concludes. Participants leave with a clear understanding of the information presented and decisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants follow up on work assignments from the meeting. Thus, a successful meeting requires important steps to be taken before, during, and after the meeting session.

Figure 3.5 Browser with before, during, after image.

Place your cursor at the point you want the image to appear. In this case it will be just before the second sentence in the second paragraph. Click the image icon. This time when the Image Properties window opens, click the *More Properties* button (see Figure 3.6).

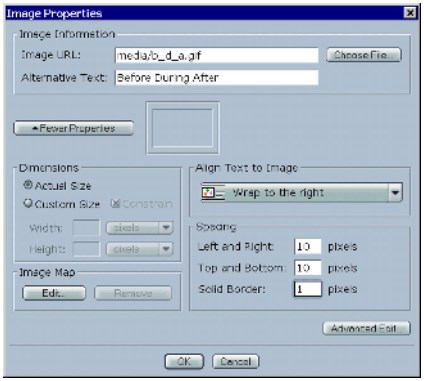


Figure 3.6 Image Properties window with More Properties open.

Enter the URL of the image (media/b_d_a.gif), and enter the alternative text "Before During After." With More Properties enabled, you can make the layout of your images look even better. Under the *Align Text to Image* button, select *Wrap to the Right*. Set Spacing to *10* pixels for both Left and Right and Top and Bottom, and set Border to *1* pixel. This will implement the text flow around the image on the right and give it a crisp one-pixel border. Now test it with your browser (see Figure 3.7).

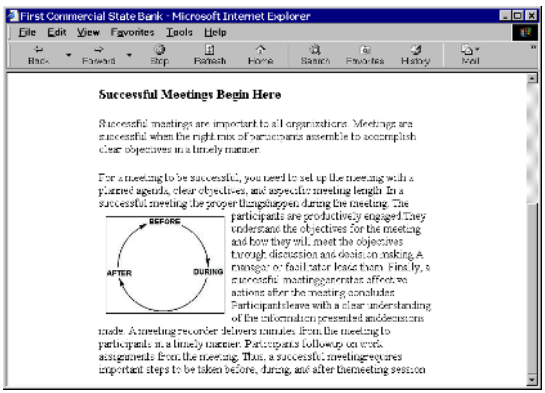

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a successful meeting generates effective actions after the meeting concludes. Participant leaves with a clear understanding of the information presented and decisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants following up on work assignments from the meeting. Thus, a successful meeting requires important steps to be taken before, during, and after the meeting session.
BEFORE
DURING
AFTER

Figure 3.7 Image with text flowing around it.

In this case, text wrapped to the right makes the elements of the Web page fit together nicely. You can also choose several other ways to place the image. Try *wrap to left* and click *OK* (see Figure 3.8).

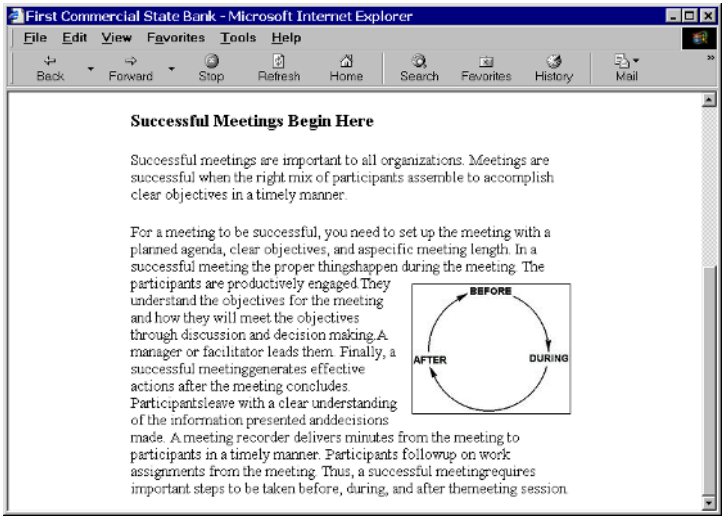

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and aspecific meeting length. In a successful meeting the proper thingshappen during the meeting. The participants are productively engaged They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making.A manager or facilitator leads them. Finally, a successful meetinggenerates effective actions after the meeting concludes. Participantsleave with a clear understanding of the information presented anddecisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants followup on work assignments from the meeting. Thus, a successful meetingrequires important steps to be taken before, during, and after themeeting session.
BEFORE
DURING
AFTER

Figure 3.8 Image with text flowing around it to the left.

There are times when an image needs to stand alone. Place it in the page with a line of text above and below. Place the cursor in the third paragraph before the sentence that starts, "Successful meetings are important to all organizations." Press the *Enter* key twice to create a new paragraph. Place the cursor between the two paragraphs. Click on the image icon. In the *Image Properties* window under *Image Information,* enter *media/b_d_a.gif* for the image file URL and click *OK*. Test it with your browser (see Figure 3.9).

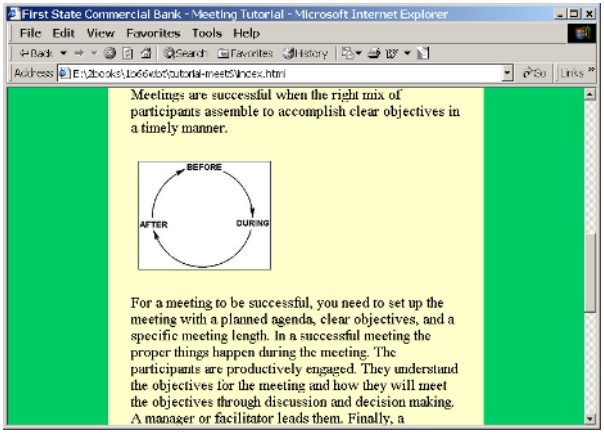

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
BEFORE
AFTER
DURING
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a

Figure 3.9 Image between two text blocks.

You can also center the image by highlighting it and clicking on the alignment icon to choose *center* (see Figure 3.10).

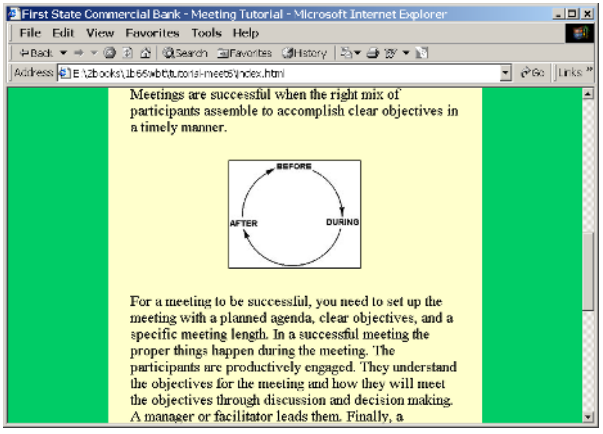

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
BEFORE
AFTER
DURING
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a

Figure 3.10 Web page with centered image.

Image Layout with FrontPage Express

Open FrontPage Express and look at the *mywbt.html* Web page. Find an appropriate location to place the title image in the Web page. In this case it will be in the first table above the heading "First State National Bank." Move the cursor to this point and press *Enter* once, then position the cursor at the very top of the table. Click on the image icon.

The Image window will pop up. Under *Browse* find the image *b_d_a.gif* and open it (see Figure 3.11).

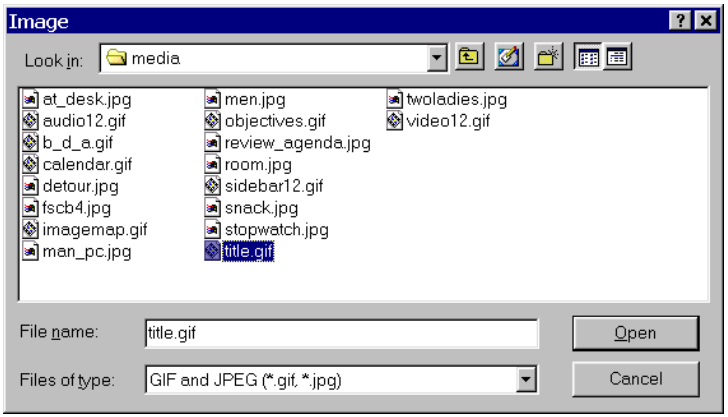


Figure 3.11 Image window.

Click *OK,* then save and test with your browser (see Figure 3.12).

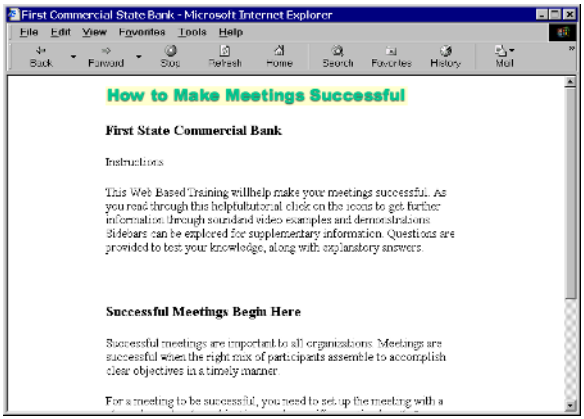
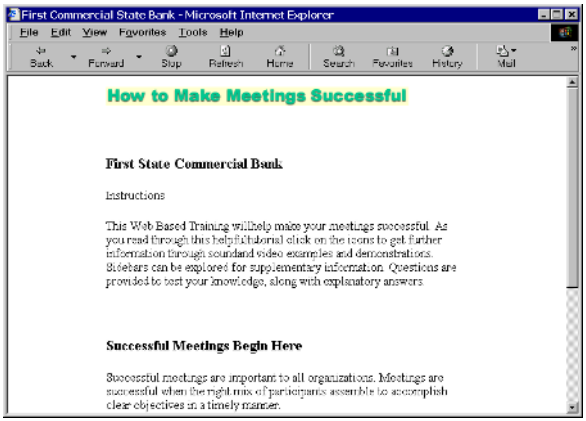

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training willhelp make your meetings successful. As you read through this helpfultutorial click on the icons to get further information through soundand video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a

Figure 3.12 Image in Web page.

It looks good but is a little too close to the first heading. Position your cursor at the beginning of the heading and press the *Enter* key. This provides a little space between the two and looks much better. Now test it with your browser (see Figure 3.13).


First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
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Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 3.13 Image spaced correctly.

Improving the Look

The title image and the icon images need to stand alone and are not placed in the body of a paragraph. When images are used as illustrations, you may want to place them within the text close to the point or concept to be illustrated. In this case the image depicts before, during, and after in a circle.

Place your cursor at the point you want the image to appear. It will be just before the second sentence in the second paragraph. Click the image icon. The Image window will open. Browse to and open the file *media/b_d_a.gif*. Save and then test in the browser (see Figure 3.14).

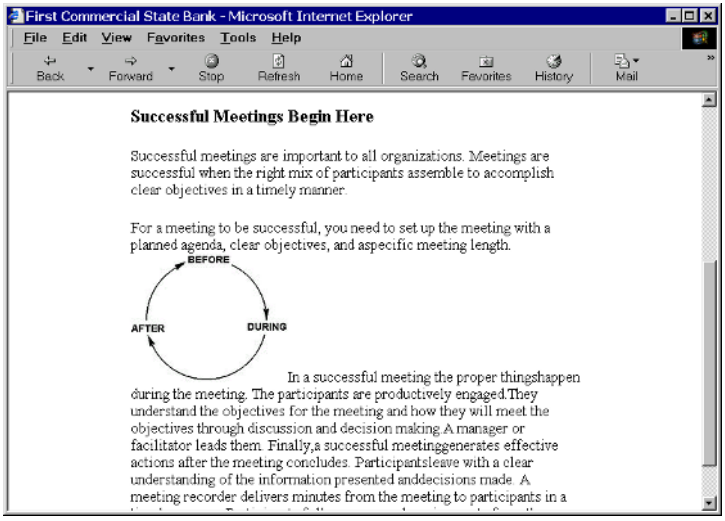

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and aspecific meeting length.
BEFORE
AFTER
DURING
In a successful meeting the proper thingshappen during the meeting. The participants are productively engaged.They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making.A manager or facilitator leads them. Finally,a successful meetinggenerates effective actions after the meeting concludes. Participantsleave with a clear understanding of the information presented anddecisions made. A meeting recorder delivers minutes from the meeting to participants in a

Figure 3.14 Browser with before, during, after image.

You can make the layout of your images look even better. Right-click the image and select *Image Properties*, *Appearance*, *Layout*, *Alignment*, *right*. Select *10* pixels for both Horizontal and Vertical Spacing, and set Border Thickness to *1* pixel. This will allow the

text flow around the image on the left, and give it a crisp one pixel border. Now test it with your browser (see Figure 3.15).

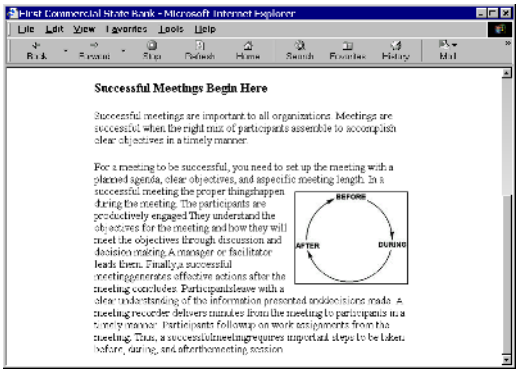
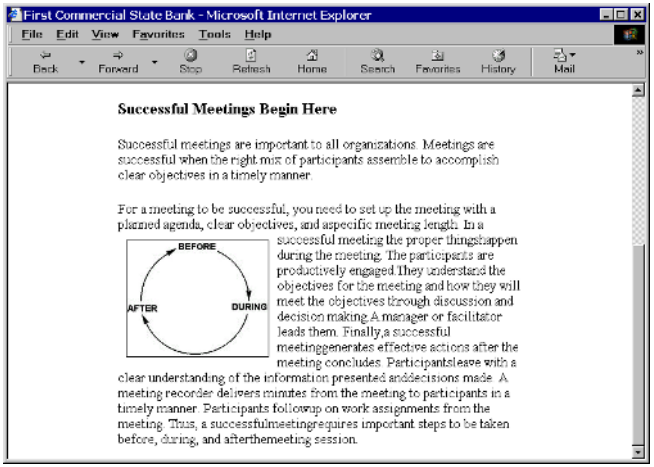

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and aspecific meeting length. In a successful meeting the proper thingshappen during the meeting. The participants are productively engaged.They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making.A manager or facilitator leads them. Finally,a successful meetinggenerates effective actions after the meeting concludes. Participantsleave with a clear understanding of the information presented anddecisions made. A meeting recorder delivers minutes from the meeting to participants in a timely manner. Participants followup on work assignments from the meeting. Thus, a successfulmeetingrequires important steps to be taken before, during, and afterthemeeting session.
BEFORE
DURING
AFTER

Figure 3.15 Image with text flowing around it.

You will find that it looks better as the text wraps the image to the left. You can also choose several other ways to place the image. Try *Alignment, left* and click *OK* (see Figure 3.16).


First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
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BEFORE
DURING
AFTER

Figure 3.16 Image with text flowing around it to the left.

There are times when you want the image to have its own space. Try placing it in the page with a line of text above and below. Place the cursor in the third paragraph before the sentence that starts, "Successful meetings are important to all organizations." Press the *Enter* key twice to create a new paragraph. Place the cursor between the two paragraphs. Click on the image icon. In the Image Properties window under *Image Information* enter the URL for the image file *b_d_a.gif* and click *OK*. Test it with your browser (see Figure 3.17).

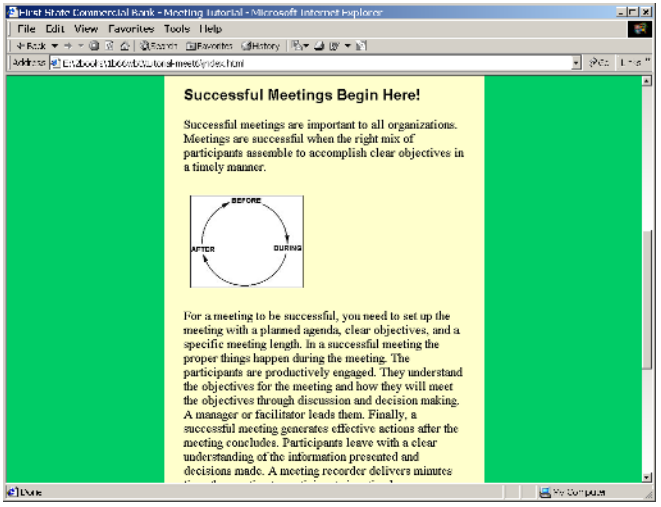
File Edit View Favorites Tools Help
Successful Meetings Begin Here!
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
BEFORE
DURING
AFTER
For a meeting to be successful, you need to set up the meeting with a planned agenda, clear objectives, and a specific meeting length. In a successful meeting the proper things happen during the meeting. The participants are productively engaged. They understand the objectives for the meeting and how they will meet the objectives through discussion and decision making. A manager or facilitator leads them. Finally, a successful meeting generates effective actions after the meeting concludes. Participants leave with a clear understanding of the information presented and decisions made. A meeting recorder delivers minutes

Figure 3.17 Image between two text blocks.

You can also center the image by highlighting it and clicking on the alignment icon to choose *center* (see Figure 3.18).

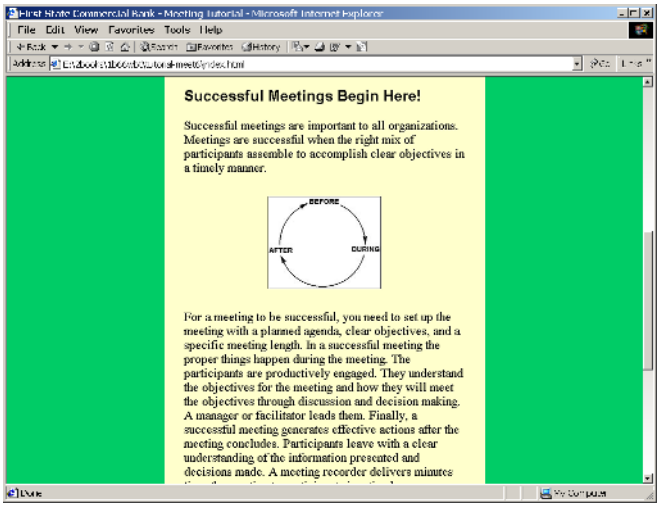
First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Successful Meetings Begin Here!
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
BEFORE
AFTER
DURING
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Figure 3.18 Web page with centered image.

FrontPage Express does not prompt you to enter alternative text. Alternative text appears when people have elected not to view images with their browser. This feature is normally not critical to the effectiveness of WBT presentations. To enter alternative text, right-click the image and select *Image Properties*, *General*. Enter your alternative text in the *Alternative Representations*, *Text* field.

Summary

Adding images to a Web page with a Web authoring program is easy. Wrapping text around the images is easy too. Chapter 6 briefly covers preparing images for use in Web pages. All of this information gives you a good start on using images in your WBT presentations. This is an essential capability for adding a little spice to your text.

4

Adding Links

Hyperlinks (links) provide the primary method of navigating between and even within Web pages. When you click on a link to another Web page, the file is sent by the Web server and downloaded into your browser. A link can also go to another spot within the same Web page. When you click on one of these links, the browser repositions the Web page, moving to the targeted location. These target locations are called anchors.

You can easily add links to your WBT presentations. For instance, we need to link to the Web pages that the Meetings WBT tutorial uses as sidebars. To create a Web page for the first sidebar Example Agenda, open Composer or FrontPage Express. Press the *Enter* key three times. Type the following text.

> Example Agenda
> The example agenda below incorporates all the elements necessary to make an agenda effective:

Save it as *sidebar_c1_1.html* in your *1webwork* folder.

When you test it in your browser, it will appear as Figure 4.1 shows.

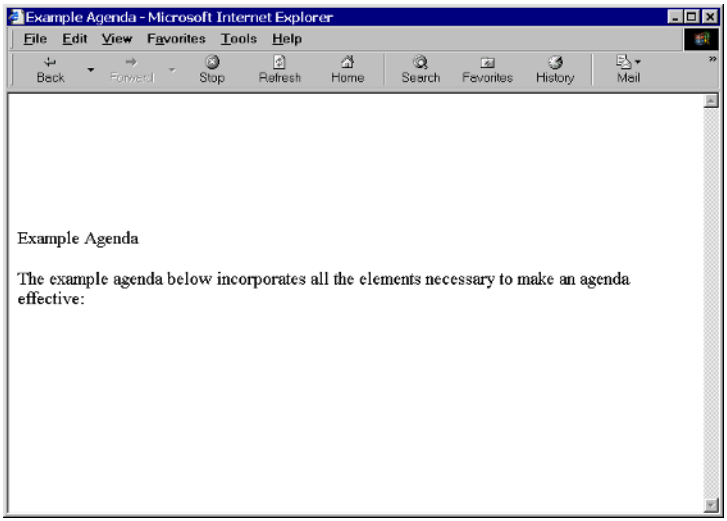

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Example Agenda
The example agenda below incorporates all the elements necessary to make an agenda effective:

Figure 4.1 The beginning of the sidebar Web page.

Now we can link to this page from *chapter1.html.*

Creating a Link with Composer

Open *chapter1.html* Web page in Composer. Scroll down to the end of the fourth paragraph. Below the fourth paragraph you will see the sentence

> An effective agenda has the following components.

Click and highlight the word *agenda*. Click the link icon.

The *Link Properties* window will open. Enter *sidebar_c1_1.html* in the Link Location box. Because all the html files are in the folder, the URL is simply the file name (see Figure 4.2).

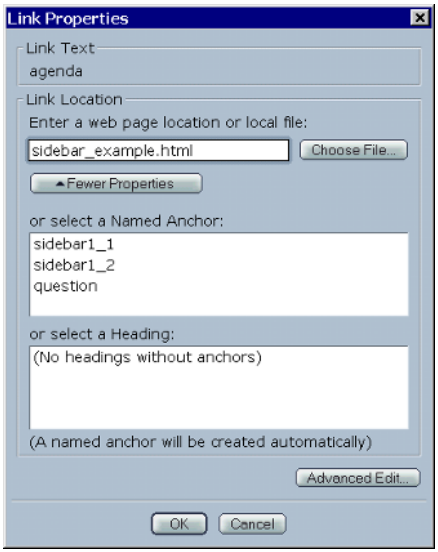


Figure 4.2 Link Properties window.

You just created a link from one Web page to another. Clicking on the link will trigger the browser to request the new Web page and load it for viewing. A link is indicated visually by the special text color. A link is also identified by underlining (see Figure 4.3).

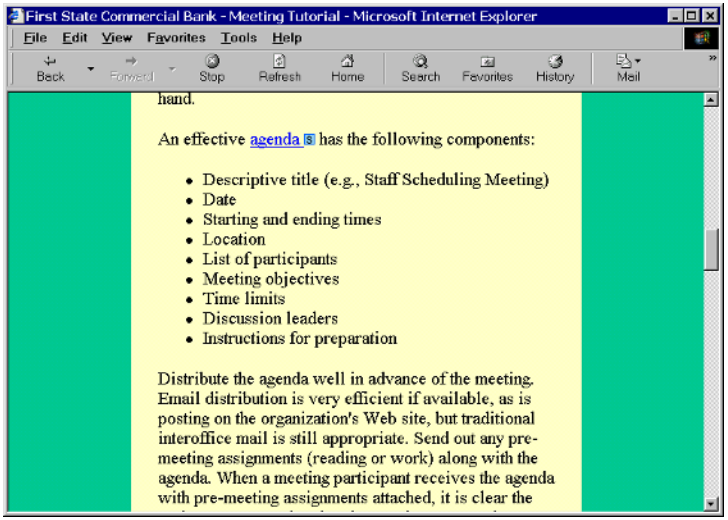

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
hand.
An effective agenda has the following components:
Descriptive title (e.g., Staff Scheduling Meeting)
Date
Starting and ending times
Location
List of participants
Meeting objectives
Time limits
Discussion leaders
Instructions for preparation
Distribute the agenda well in advance of the meeting. Email distribution is very efficient if available, as is posting on the organization's Web site, but traditional interoffice mail is still appropriate. Send out any pre-meeting assignments (reading or work) along with the agenda. When a meeting participant receives the agenda with pre-meeting assignments attached, it is clear the

Figure 4.3 Web page with link.

Links are blue (default) and change to purple (default) once you have used them. You can change these default colors, but it's not advisable as these default colors are familiar to your students.

Creating a Link with FrontPage Express

Open *chapter1.html* Web page in FrontPage Express. Scroll down to the end of the fourth paragraph. Below the fourth paragraph you will see the sentence

> An effective agenda has the following components.

Click and highlight the word *agenda*. Click the link icon.

The Create Hyperlink window will open. Go World Wide Web, URL, and enter *sidebar_c1_1.html*. Make certain you overwrite the "http://" that appears in the box by default. Because all the html files are in the folder, the URL is simply the file name (see Figure 4.4).

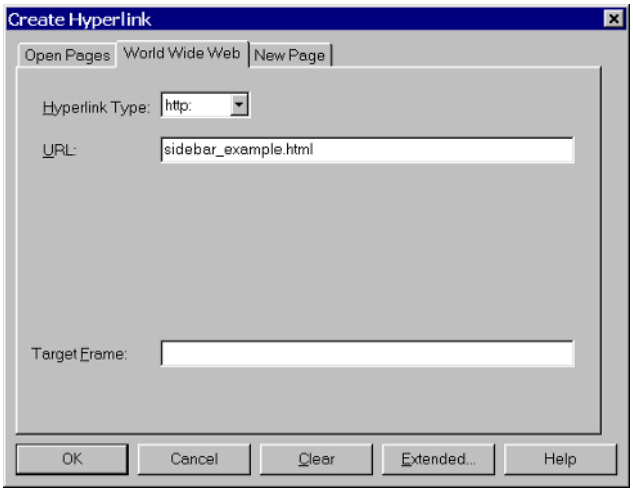
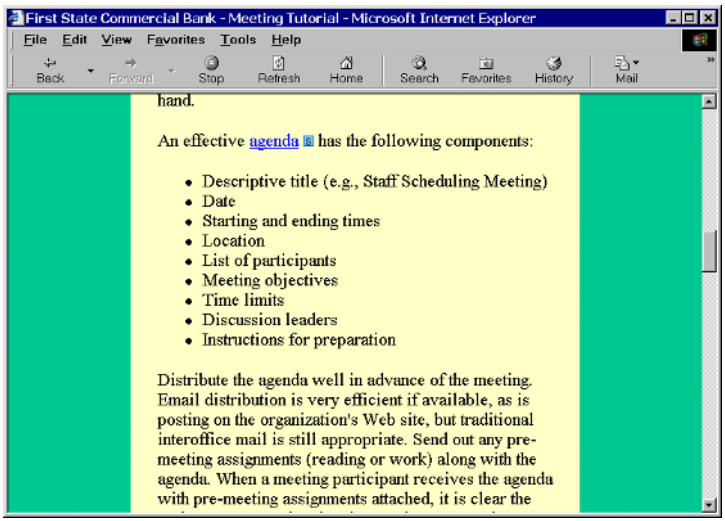


Figure 4.4 Link Properties window.

You just created a link from one Web page to another. Clicking on the link will trigger the browser to request the new Web page and load it for viewing. A link is indicated visually by the special text color. A link is also identified by underlining. (see Figure 4.5).

Links are blue (default) and change to purple (default) once you have used them. You can change these default colors, but it's not advisable as the default colors are familiar to your students.


First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
hand.
An effective agenda has the following components:
Descriptive title (e.g., Staff Scheduling Meeting)
Date
Starting and ending times
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Distribute the agenda well in advance of the meeting. Email distribution is very efficient if available, as is posting on the organization's Web site, but traditional interoffice mail is still appropriate. Send out any pre-meeting assignments (reading or work) along with the agenda. When a meeting participant receives the agenda with pre-meeting assignments attached, it is clear the

Figure 4.5 Web page with link.

The HTML

To develop an understanding of HTML and hyperlinks, look at the HTML version of your work:

```
An effective <a
href="sidebar_c1_1.html">agenda</a>
has the following components:
```

The word *agenda* becomes the "hot" word, which activates the link when clicked. The HTML markup wraps around the word (agenda) which becomes the link. The markup includes the URL of the target Web page.

Images and Links

You can put images to work as links. Images that serve as icons on a navigation bar work especially effectively as links. They can make it easy for a student to move through WBT presentations.

Link an Image with Composer

Open *chapter1.html* Web page in Composer. Remove the text link to the sidebar Web page you created. Scroll down to the link you created called *agenda*. Right-click the link and select *Remove Links*. See Figure 4.6.

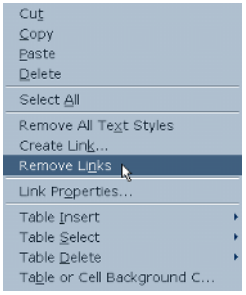


Figure 4.6 Removing a link.

Composer Image Link

Insert an image that will represent a link to a sidebar Web page. Use this same image wherever there is a need to link to a sidebar. With repetitive use, students will remember what it means. Use images as icons to represent links to sound and video files as well (see Figure 4.7).

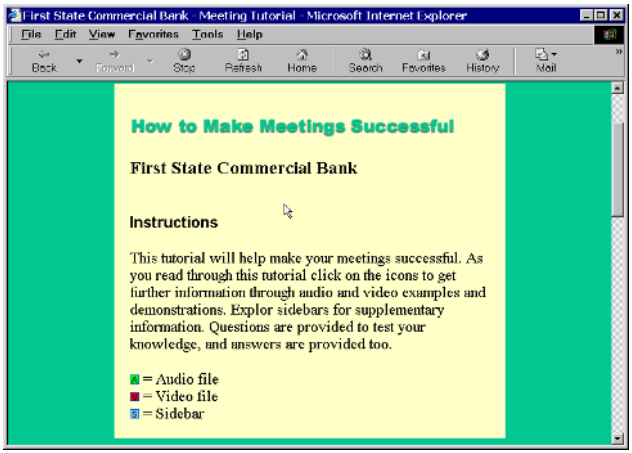

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
How to Make Meetings Successful
First State Commercial Bank
Instructions
This tutorial will help make your meetings successful. As you read through this tutorial click on the icons to get further information through audio and video examples and demonstrations. Explor sidebars for supplementary information. Questions are provided to test your knowledge, and answers are provided too.
= Audio file
= Video file
= Sidebar

Figure 4.7 Browser displaying icons in legend.

Insert the image for sidebar between the words *agenda* and *has*. The URL will be *media/sidebar12.gif*. Save and test in the browser. The image for linking to sidebars will appear in the Web page (see Figure 4.8).

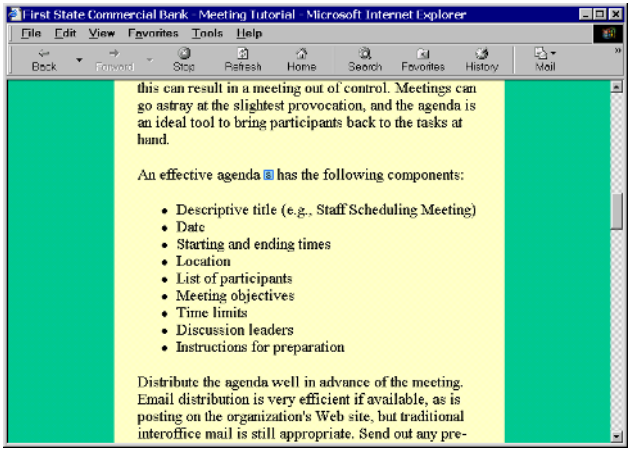

First State Commercial Bank - Meeting Tutorial - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
this can result in a meeting out of control. Meetings can go astray at the slightest provocation, and the agenda is an ideal tool to bring participants back to the tasks at hand.
An effective agenda has the following components:
Descriptive title (e.g., Staff Scheduling Meeting)
Date
Starting and ending times
Location
List of participants
Meeting objectives
Time limits
Discussion leaders
Instructions for preparation
Distribute the agenda well in advance of the meeting. Email distribution is very efficient if available, as is posting on the organization's Web site, but traditional interoffice mail is still appropriate. Send out any pre-

Figure 4.8 Browser showing sidebar icon in page.

Highlight the sidebar image, then click the link icon. The Link Properties window will open. Enter *sidebar_c1_1.html* in the Link Location box (see Figure 4.9).

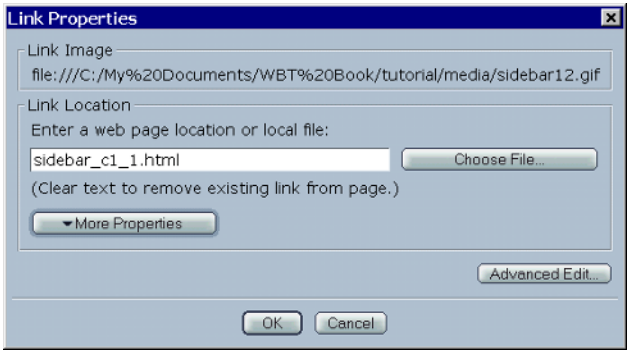


Figure 4.9 Link Properties window.

Click *OK*, save, and test with your browser. Try clicking the sidebar image. The browser goes to the sidebar Web page, *sidebar_c1_1.html*.

Link Back Using an Anchor

In the Meetings WBT tutorial, students will want to return after viewing the sidebar Web page. You want them to return to the same point at which they left. You can accomplish this through the use of an anchor. An anchor is like a target within a Web page. Make a link in the sidebar Web page (*sidebar_c1_1.html*) that not only goes back to *chapter1.html* but takes a student back to the point he or she left.

On the Chapter 1 Web page, place the cursor at the beginning of the line that begins "An effective agenda has…" and click on the anchor icon.

The Named Anchor Properties window will open. Enter the name *anchor_c1_1* in the *Anchor Name* box (see Figure 4.10).

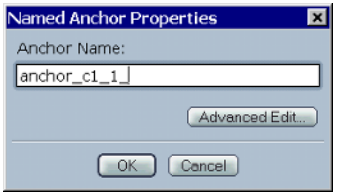


Figure 4.10 Named Anchor Properties window.

Click *OK* and save your work. Open the file *sidebar_c1_1.html* in Composer. Place the cursor at the top of the page and press the *Enter* key three times to allow space for new text entry. Place the cursor at the top again, and type the word *Back*. Save and test in your browser (see Figure 4.11).

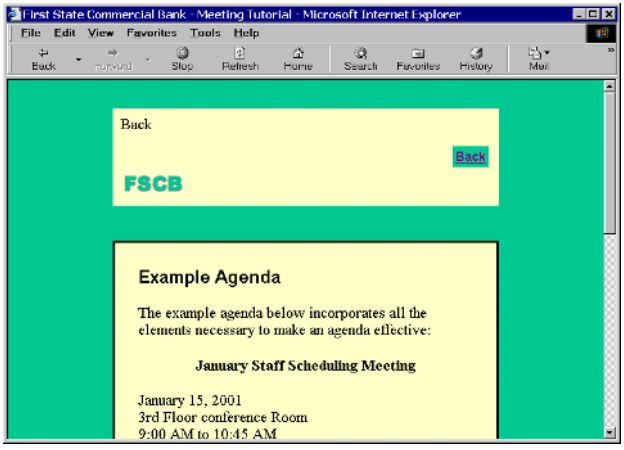


Figure 4.11 Browser showing page with Back at top left.

Click and highlight the word *Back*. Click on the link icon. The Link Properties window will open. Enter the URL *chapter1.html* in the link location box, adding *#anchor_c1_1* to the end (see Figure 4.12).

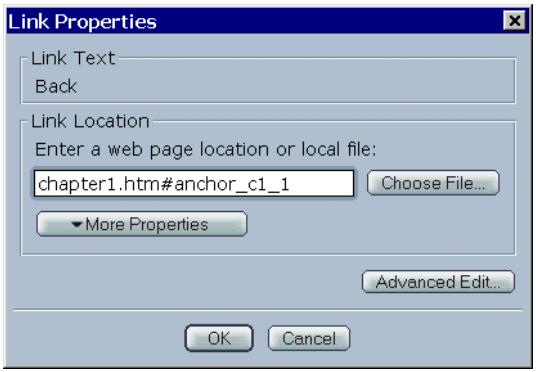


Figure 4.12 Link Properties window.

Click *OK* and save. In the browser, open the file *chapter1.html*. Click on the sidebar image linked to *sidebar_c1_1.html*. The browser brings you to the first sidebar page. Now test your first anchor. Click on the link *Back* at page top. The browser brings you back to *chapter1.html* with the page scrolled to the anchored spot at the top of the page, almost the exact spot you left!

Link an Image with FrontPage Express

Open *chapter1.html* Web page in FrontPage Express. Remove the link to the sidebar Web page you created. Scroll down to the link you created called *agenda*. Click the link and then click the link icon.

The Edit Hyperlink window will open. Clear the URL box of the entry *sidebar_c1_1.html* and click *OK* (see Figure 4.13). This removes your text link.

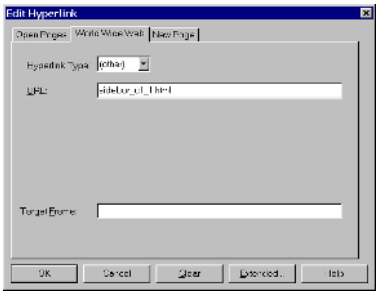
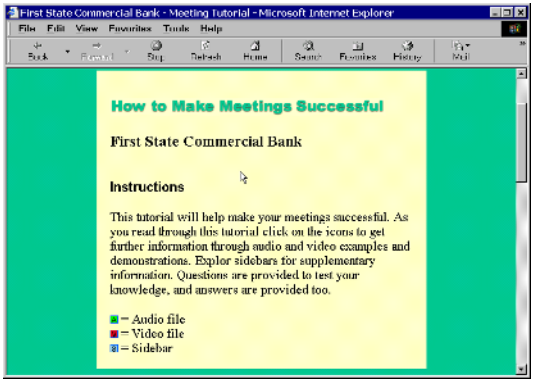


Figure 4.13 Removing the word link.

FrontPage Express Link

Insert an image that represents a link to a sidebar Web page. Use this same image wherever there is a need to link to a sidebar. With repetitive use, students will remember what it means. Use images as icons to represent links to media files as well (see Figure 4.14).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File Edit View Favorites Tools Help
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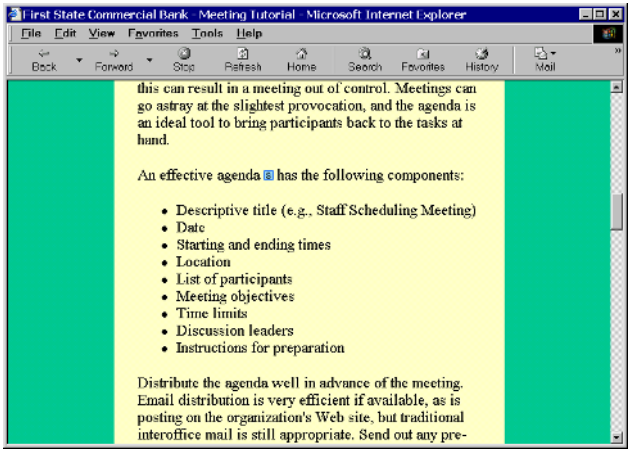
Instructions
This tutorial will help make your meetings successful. As you read through this tutorial click on the icons to get further information through audio and video examples and demonstrations. Explor sidebars for supplementary information. Questions are provided to test your knowledge, and answers are provided too.
= Audio file
= Video file
= Sidebar

Figure 4.14 Browser displaying icons in legend.

Insert the image for a sidebar between the words *agenda* and *has*. The URL will be *media/sidebar12.gif*. The sidebar image will appear in the Web page (see Figure 4.15).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Back Forward Stop Refresh Home Search Favorites History Mail
this can result in a meeting out of control. Meetings can go astray at the slightest provocation, and the agenda is an ideal tool to bring participants back to the tasks at hand.
An effective agenda has the following components:
Descriptive title (e.g., Staff Scheduling Meeting)
Date
Starting and ending times
Location
List of participants
Meeting objectives
Time limits
Discussion leaders
Instructions for preparation
Distribute the agenda well in advance of the meeting. Email distribution is very efficient if available, as is posting on the organization's Web site, but traditional interoffice mail is still appropriate. Send out any pre-

Figure 4.15 Browser showing sidebar icon in page.

Highlight the sidebar image, then click the link icon. The Create-Hyperlink window will open. Enter *sidebar_c1_1.html* in the URL box.

Click *OK*, save, and test in your browser. Try clicking on the sidebar image. The browser goes to the sidebar Web page, *sidebar_c1_1.html*.

Link Back

In the Meetings WBT tutorial, students will want to return after viewing the sidebar Web page. You want them to return to the same point at which they left. You can accomplish this through the use of an anchor. An anchor is like a target within a Web page. Make a link in the sidebar Web page (*sidebar_c1_1.html*) that not only goes back to *chapter1.html* but takes a student back to the point he or she left.

Place the cursor at the beginning of the line that begins "An effective" and highlight the first two words. Click the hyperlink icon. In the Create Hyperlink window, go *World Wide Web*, *URL* and enter *chapter1.html#anchor_c1_1* (see Figure 4.16).

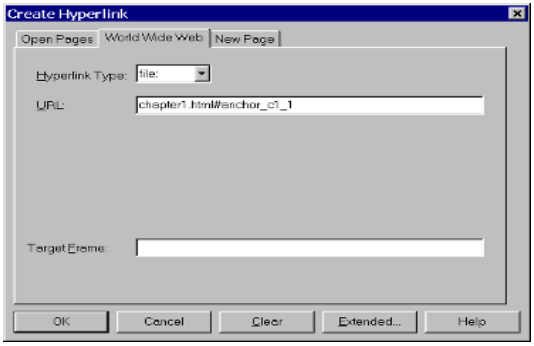


Figure 4.16 Create Hyperlink window.

Click *OK* and save your work. Open the file *sidebar_c1_1.html* in FrontPage Express. Place the cursor at the top of the page and press the *Enter* key three times to allow space for new text entry. Place the cursor at the top again, and type the word *Back*. Save and test in the browser (see Figure 4.17).

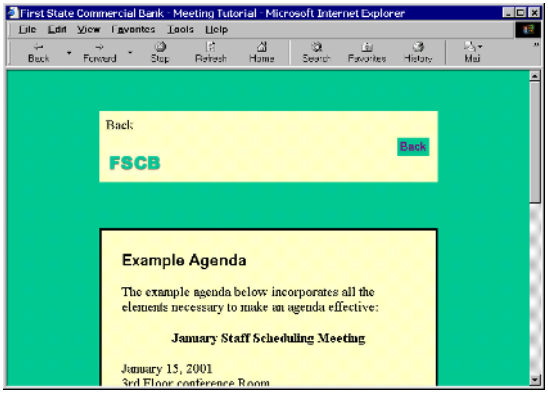


Figure 4.17 Browser showing page with Back at top left.

Click and highlight the word *Back*. Click on the link icon. The Create Hyperlink window opens. Enter the URL *chapter1.html* in the link location box, adding *#anchor_c1_1* to the end.

Click *OK* and save. In your browser open the file *chapter1.html*. Click on the sidebar image linked to *sidebar_c1_1.html*. The browser takes you to the first sidebar page. Now test the first anchor. Click on the link *Back* at page top. The browser takes you back to *chapter1.html* with the page scrolled to the anchored spot at the top of the page, almost the exact spot you left!

To an Image

You can also link to an image just as you link to a Web page. When you click a link to an image file, the browser will load and display the image just as it would a Web page (see Figure 4.18).

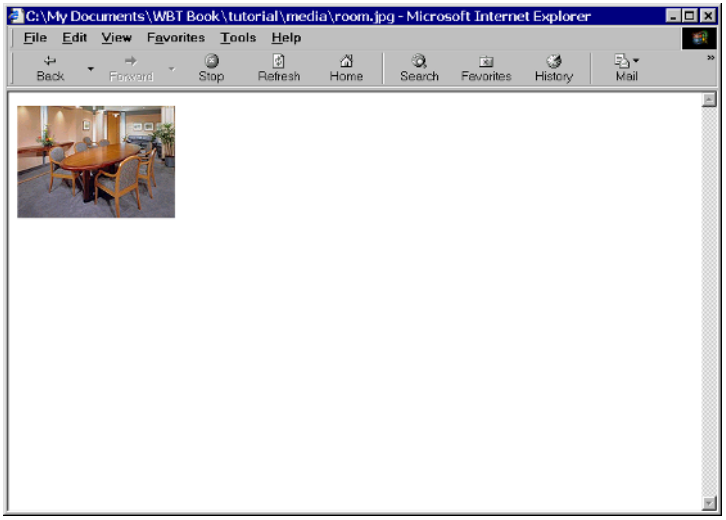

C:\My Documents\WBT Book\tutorial\media\room.jpg - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail

Figure 4.18 Browser displaying image only.

URL Essentials

There are a few things to know about URLs. Although they may seem more theoretical than practical, it's necessary for you to understand them. It all has to do with where your Web files are located.

Absolute Reference

Let's dissect a typical domain address to learn more:

```
http://www.abccollege.edu/soc/
info.html
```

You can tell this file is on the Web by the *http://* at the beginning. HTTP (Hypertext Transport Protocol) is the protocol by which the file will be moved across the Internet. The *www.abccollege.edu* is the unique domain address. This part of the URL is not case sensitive. Anything following this domain name is case sensitive. The folder and target file are indicated by *soc/info.html.* What you see is a path from a root folder (the domain name *www.abccollege.edu*) to a subfolder named *soc* (for Sociology at ABC College) and finally to the target HTML file (Web page) named *info.html.*

When you express a Web address with a path from *http://* to the unique domain name (*www.abccollege.edu*) to the target file (*/soc/info.html*), you are using an absolute reference. Domain names are unique, and the folders and files following the domain name are unique within that domain. This means you have absolutely defined the location of a target file.

Relative Reference

Within a domain, you can make your references relative to the folder structure of the domain. Study the folder structure in Figure 4.19 for ABC College (www.*abccollege.edu*).

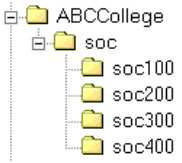


Figure 4.19 ABC College website folder structure.

Advance

If you want the navigation path to go from *index.html* (a Web page) in the folder *soc* to *syllabus.html* (another Web page) in the subfolder *soc300*, you express the link as follows:

```
soc300/syllabus.html
```

In contrast, the absolute URL is:

```
http://www.abccollege.edu/soc/soc300/
syllabus.html
```

Note that the absolute URL can't work on your own computer where you create and test the website Web pages. But the relative link works on both your computer and the Web host computer, assuming you have identical folder structures. And you should have identical folder structures on your own computer and on the Web host computer to accommodate parallel and identical websites on each computer.

Retreat

You can place a link in *syllabus.html* that goes back to *info.html* in the root folder *soc*. What does that path look like? You use the expression *../* to go back up the folder tree. The link from *syllabus.html* to *info.html* is:

```
../info.html
```

The *../* goes from the *soc300* subfolder to the *soc* folder.

Retreat and Advance

If you want to put a link to *syllabus.html* (in the *soc300* subfolder) from the Web page *intro.html* in the *soc200* subfolder (i.e. *www.abccollege.edu/soc/soc200*), the relative link would be:

```
../soc/soc300/syllabus.html
```

The first *../* takes you up the tree (to the *soc* folder from the subfolder *soc200*), and the *soc/soc300* takes you down the tree (from the *soc* folder to the subfolder *soc300*).

Test All Links

This system linking Web pages inside a website is simple and logical, but it is easy to make mistakes by forgetting a forward slash or a period. Always test your links immediately after you create them to see if they work.

Relative links work effectively in Web pages on your own computer or in the Web pages on your Web host computer. As a WBT developer, you can keep and develop a copy of the WBT presentation on your computer. Later, you simply upload a copy to your Web host computer.

Good Practice

When linking to your own Web pages within your website, use relative references. It's generally easier. When linking to Web pages elsewhere on the Web, use absolute references. It's invariably absolutely necessary.

Create an Email Link

Many Web developers use an HTML form to send email messages. Because so many people today are using (and are comfortable using) email software, we suggest you use email links rather than forms. This is easier for students.

An email link will open a student's email program when clicked. The addressee will already be in the *To:* line. Look at this example of an email link:

```
<a href="mailto:
instructor@mywbt.com">Contact Us</a>
```

Notice that the href isn't a URL; it's an email address preceded by *mailto:.* Neither Composer nor FrontPage Express provides an easy way to insert email links. With either, you have to insert the HTML markups manually.

In Composer, click and highlight the text to be linked. Go *Insert*, *HTML*. Enter the HTML markups and text. In FrontPage Express, click and highlight the text to be linked. Go *Insert*, *HTML Markup*, and enter the markups and text.

Summary

Making links to other Web pages (or even media files) is easy. Just highlight the word, words, or image you desire to make the link

and click on the link icon. Then enter the URL of the target Web page. You can also create anchors within Web pages and then make such anchors the targets of links from other Web pages (or from other places within the same Web page).

The most difficult part of this process is naming the URL properly. You can use relative or absolute links. Always test your links after you make them to be sure they work as designed.

Linking is the primary means of making the Web and WBT presentations interactive. Be sure to learn to make links well enough so that you feel comfortable and competent creating them in your routine WBT development.

This Page Intentionally Left Blank

II

Refining Web Pages

5

Webtop Publishing

While it is not difficult to create Web pages, it takes skill to create Web pages that look good and are easy to read. Reading text on a computer screen is not as comfortable as reading text on a printed page. Because a computer monitor screen is low resolution, you need to take every step possible to improve readability. This chapter will provide some basic principles of Web typesetting and layout (Web typography) that will help you create WBT presentations that are both easy-to-read and attractive.

The Critical Role of Text

If you surf the Web casually, you might think sound, video, and animation are the most important elements in WBT presentations. No doubt these media add significantly to the effectiveness of WBT presentations. Nonetheless, text remains the most important element in a Web page.

If all you have is sound, you essentially have the equivalent of a cassette tape presentation. Most people listen to cassettes only while commuting in their cars. If all you have is video, you have the equivalent of a videotape presentation. Although videotapes have some merit for use in training and education, they have never become the mainstay they promised to be when introduced many years ago.

Indeed, sound and video generate passive participation on the part of students. Reading entails active participation and is more likely to keep students awake (although there is no guarantee). In any case, text is a more efficient and inexpensive medium. It's here to stay, regardless of the allure of other media.

Fonts

Many WBT developers have dozens of fonts at their disposal. It can be tempting to go wild with the use of fonts when developing WBT presentations, but this is not a good idea. In order to have your text look professional and remain readable, you should limit the use of fonts to no more than two or three. Change fonts only when necessary, not on a whim.

If your students reflect the general public, as a practical matter, you can count on all students having only the following fonts:

PC: Times New Roman, Arial, Courier New

Mac: Times, Helvetica, Courier

These fonts are comparable across platforms. Times New Roman and Times are the default serif fonts for Microsoft and Netscape browsers. Arial and Helvetica are the default sanserif fonts. Courier New and Courier are the default monospaced fonts. If you stick to these fonts, you can be assured that what you design is exactly what every student will see. While this may seem very limited, it still provides you ample latitude to design attractive Web pages.

If you develop WBT presentations for an intranet and you know that everyone on the intranet has a certain set of fonts, you can use those fonts in addition to the default fonts mentioned here.

Layout

A basic design principle is to make a readable column. Chapter 2 covered how to make a column of text by use of a table. With the table limited to 500 pixels in width, each line is 9-12 words when using the default font (12 points). All together this makes the text readable.

Another result of using the table to limit the column width is margins (white space) on either side of the text block. This again works to improve readability. In your experience surfing the Web, you may have come across Web pages where the text fills the screen from right to left. This practice makes reading more difficult and can quickly overwhelm the reader.

The generous use of paragraphs is a necessary technique. Shorter paragraphs work better on the Web. Unending text that requires endless scrolling will tend to put off students. If possible you should make your paragraphs shorter than one browser display. You don't want students to perceive a long scroll every time they look at the

screen. Although scrolling isn't necessarily bad, you need to give students some relief in every screen.

Use plenty of headings too. Headings are great for providing visual relief, and they help readers quickly find the information they seek.

Expectations are different for a Web page than for a page in a book. It is not unusual to have many pages of unadorned text in a book. On the Web, however, your students expect a little color. It doesn't need to be much, but put some color trimmings on the page.

There is risk of overdoing it when employing page trimmings for your WBT presentations. Strive for a clean, business-like appearance. Use images and other media when it supports the goals of your WBT presentations.

A World of Examples

The Web offers a myriad of layout examples for you to examine and imitate. Search for good examples on the Web. Examples will range from the highly complex to the elegantly simple. When you find a Web page that has an attractive layout, view the HTML to assess the page's complexity. If you want to use the Web page, save it to your hard disk. Then delete the content but save the layout to use as a template.

This is a common practice among Web developers. Developers often make alterations to someone else's layout to suit their specific needs. Finding examples of attractive Web pages on the Web can save you a lot of time. Build up your library of templates. Generally speaking, the layout of a Web page is not copyrightable. However, the content and art in a Web page are copyrightable, and you should not use them without permission.

Other Template Resources

You can also find templates in Web authoring software, computer book CDs (especially books on HTML), and websites catering to people learning HTML. Find templates useful to your needs and save them on your hard disk. Look at print resources as well. Magazines and books can be excellent resources for good layout. Of course you will need to translate their layout to HTML, but this can be a good exercise for a novice WBT developer.

Typesetting

Typesetting is an important but sometimes overlooked step in developing effective WBT presentations. When typesetting is well done, you don't notice it. When it's poorly done, students will find the reading experience awkward or even distracting. You need to follow the basic rules (traditional rules) set forth in this chapter to make certain your WBT presentations are professional and credible.

Follow the Traditional Guidelines

Because typography has been around so long, the guidelines for competent practice are well established. Following a few simple rules makes it easy to give your text a professional look.

All Caps

Don't use all caps. People find them difficult to read. All caps is strictly a typewriting technique. Specifically, don't use all caps for headings or headlines.

Bold

Use bold for headings, headlines, and for warnings. Do not use it for emphasis. Bold is disruptive of reading. If you use bold for emphasis inside a text block, it will make reading more difficult not easier.

Bold Italics

Use bold italics only as substitute for bold.

Border

Use borders to create boxed text. Use boxed text for sidebars, special instructions, and other appropriate uses. You can create boxed text by putting text inside a one-cell table and showing the border on the table.

Bullets

HTML supports bulleted lists. These can dress up your text and make it look professional.

Italics

Use italics for emphasis and for the common uses set forth in style manuals, such as for book titles.

Numbers

The Web supports numbered lists. Numbered lists are useful to readers.

Rules

It was once common practice to frequently use rules (horizontal lines) in Web pages. Rules became overused, and you don't see rules much any more. But don't overrule their use entirely. Use them occasionally when appropriate to separate different sections of text.

Superscripts and Subscripts

The Web supports superscripts and subscripts. Use them where appropriate.

Type Size

You can change the type size for your Web page text. For easy reading, set the type size to normal, which is 12 points. A +1, +2, or +3 increment will make the type size larger for special uses such as headings or headlines. A -1, -2, or -3 increment will make the type size smaller for uses such as block quotes. Be careful when you use smaller type sizes. People find small type difficult to read on the screen.

Federal Requirements

Under the Rehabilitation Act, Section 508, the federal government requires access to digital displays for the visually impaired. Changing the default type size in a browser can make text larger or smaller and may satisfy 508. Using the scheme above of incremental adjustments, the text will be displayed larger or smaller relative to the default type size.

However, were you to use absolute type sizes (e.g., 16 points), the text would be displayed in such absolute sizes regardless of the default selected by the user. Thus, disabled users would not have the control they need to read while still preserving your

typesetting scheme.

Consequently, use incremental adjustments rather than absolute type sizes to change the type sizes in your text. Consult the World Wide Web Consortium's Web Accessibility standards (*http://www.w3.org*) for complete guidelines on accessibility for the disabled. Although Section 508 applies only to governmental Web presentations, it's a good idea to comply otherwise too.

Underlines

Don't underline words in Web pages. An underline designates a link. If you put underlines to other uses, you will confuse your students.

Headings

Headings are normally set in bold or larger size type than the text. Capitalize the first letter of each word except for conjunctions and prepositions. Sometimes only the first letter of the first word is capitalized.

Headlines

Headlines should be a sentence with a subject and a verb. Only the first letter of the first word is capitalized. Headlines are normally set in bold and larger size type than the text.

Add an Image

The addition of a small image can make text look better. Simply adding a small logo or trademark in the upper portion of a Web page can make the page look better and give it a stamp of authenticity that it otherwise lacks. This works well for recognizable logos

and trademarks, but it works for unknown logos too. If you don't have a logo or trademark, create one for your WBT presentation and use it for text pages that would otherwise be without any color trimmings.

You can also add abstract or design images as Web page trimmings, which can make text pages more attractive. Because this takes considerably more design skill than just adding a logo or trademark, you may have to employ the services of a digital artist. You can also use images found bundled on computer graphics CDs (clip art).

Beyond Basic Typesetting

The basics we covered in this chapter are enough to get you started, but there are methods of advanced typesetting that are supported by Web standards. The standard is Cascading Style Sheets (CSS) which supports fine-grained typesetting and layout and is not difficult to use. You can get information about using this full-fledged Web typesetting technology in *Typography on the Web*, Sinclair (AP Professional, 1999) and also in Chapter 15.

In addition, Microsoft's font embedding and Bitstream's TruDoc enable you to use the fonts of your choice and embed them in a Web page so that readers will be able to see your WBT presentations fully typeset with your choice of fonts. For more information, read *Typography on the Web* and also Chapter 15.

Text for Tutorial

Typesetting the Meetings WBT presentation is a good place to start. Let's add a sidebar to learn a few typesetting basics.

Using Composer

Open *sidebar_c1_1.html* in Composer. You will find the one-cell table holding the text you entered earlier.

```
"Example Agenda The example agenda
below incorporates all the elements
necessary to make an agenda
effective:"
```

Below this add the text:

```
January Staff Scheduling Meeting


January 15, 2001

3rd Floor conference Room

9:00 AM to 10:45 AM

Participants: Bill, Mary, Sue, George

Note - Please bring last month's
overtime records.
```

This will give you ample text to learn some typesetting features.

Add Another Table

Place your cursor at the top of the page and insert another table. Click the Table icon.

The Insert Table window will open. Set Rows to *1*, Columns to *2*, Width to *500* pixels, and Borders to *1*. Click *OK* (see Figure 5.1).

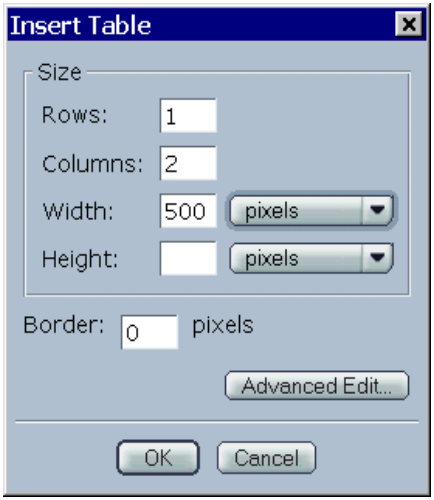


Figure 5.1 Insert Table window.

Now, fine-tune your table a bit. Right-click in the new table and go *Table Cell Properties*, *Table*, and set Spacing to *0*, Padding to *10*, and Spacing to *10*. Click *OK*. Now you have a new table at the top of the page. It is separated from the old table by a line of space. You will learn why this is important when we change the page background colors in Chapter 6.

Add an Image

Now make the text look better by adding a trademark image that will appear at the top of each page. Place your cursor in the left cell of the new table. Click on the image icon. The Image Properties window will open. Enter *media/fscb4.jpg* for the URL and "First State Commercial Bank" in the Alternative Text box. Click *OK*, save, and test your work in the browser (see Figure 5.2).

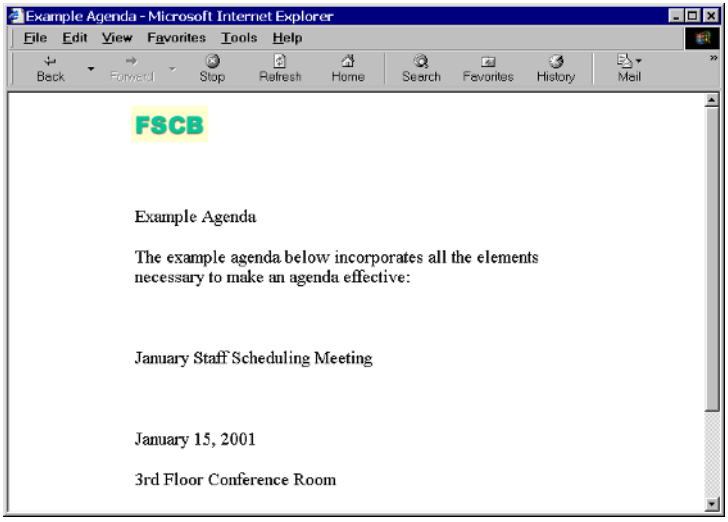

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
FSCB
Example Agenda
The example agenda below incorporates all the elements necessary to make an agenda effective:
January Staff Scheduling Meeting
January 15, 2001
3rd Floor Conference Room

Figure 5.2 FSCB image in table, in browser.

The image looks okay, but not quite as good as it could. Chapter 6 shows how to change the background color of the table to match the yellow in the image.

Bold and Italic

In the first sentence, highlight the word *necessary*. Click on the italic icon.

The word will change to italic type. Highlight the word *effective*. Click on the bold icon.

The word changes to bold. (Note that this is not a correct use of bold but will suffice for an illustration.)

Change Type Size

Highlight the words *January Staff Scheduling Meeting*. Click on the type size decrease icon (on the left).

The type size will decrease one increment. (Click on the type size increase icon, on the right, and the type size will increase one increment.)

Change Typeface (Font)

Highlight the words *example elements*. Go *Format*, *Font*, *Helvetica Arial* (see Figure 5.3). The words *example elements* will now appear in Arial for PCs and Helvetica for Macs.

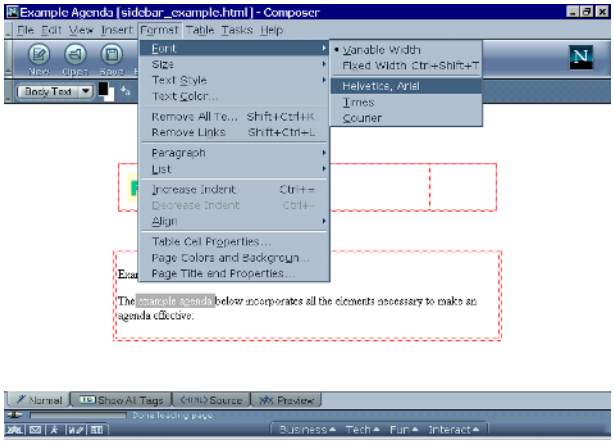


Figure 5.3 Changing the typeface.

Headings

You already learned how to make HTML headings in Chapter 2 (headings set at level 3). Using the HTML headings is a good practice (levels 1-6). But there is another way to create headings. Increase the type size of the heading and make it bold. Put a line space above and below by pressing the *Enter* key. Use this technique to make "Effective Agendas" a heading and also "January Staff Scheduling Meeting."

Bulleted Lists

Place the cursor in front of the sentence that starts "January 15, 2001." Press the *Enter* key. Do the same for the next three lines. Put the cursor at the beginning of the line and click on the bulleted list icon. Do the same for the next two lines.

Test the result in your browser (see Figure 5.4).

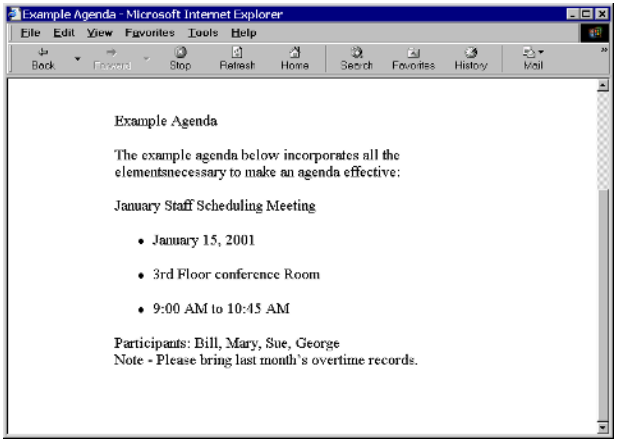

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Example Agenda
The example agenda below incorporates all the elementsnecessary to make an agenda effective:
January Staff Scheduling Meeting
January 15, 2001
3rd Floor conference Room
9:00 AM to 10:45 AM
Participants: Bill, Mary, Sue, George
Note - Please bring last month's overtime records.

Figure 5.4 Bulleted list.

Centering

Place the cursor on the heading January Staff Scheduling Meeting, click on the alignment icon, and select *Center*. This centers the heading. Normally you don't center headings, but you do center titles.

Numbered Lists

Place the cursor in front of the first participant, "Bill." Click the numbered list icon.

Do the same for the remaining participant list. Delete the commas that follow each name. Test the result in your browser (see Figure 5.5).

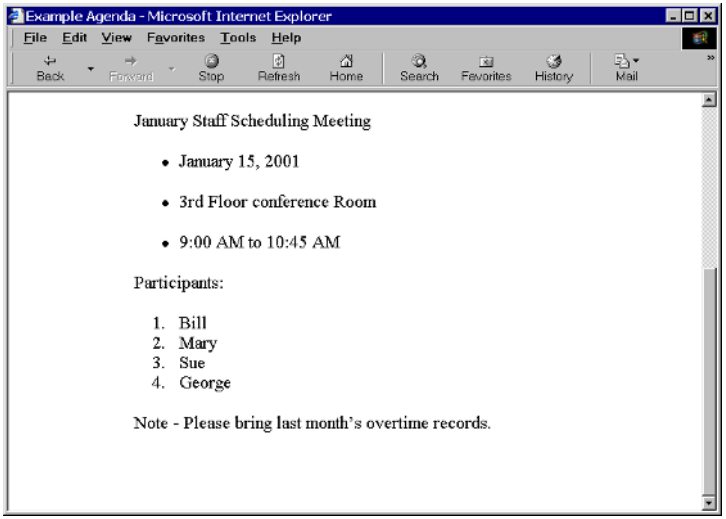

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
January Staff Scheduling Meeting
January 15, 2001
3rd Floor conference Room
9:00 AM to 10:45 AM
Participants:
1. Bill
2. Mary
3. Sue
4. George
Note - Please bring last month's overtime records.

Figure 5.5 Numbered list.

Rules (Horizontal Lines)

Place the cursor at the end of the sentence that concludes with "to make an effective agenda." Click on the rule icon.

This inserts a rule separating this last paragraph from the remainder of the text.

Tables for Organizing

Tables are effective devices when used to organize pieces of information. The Effective Agendas sidebar Web page can use a table in this fashion to organize the example agenda.

Place the cursor at the end of the sentence "Note - Please bring last month's overtime records." Insert a table with *5* rows and *4* columns. Set the Border to *1*. Click *OK*. To set further properties for the table, right-click in the table and go *Table Cell Properties*, *Table* and set the Border to *1*, Spacing to *0*, Padding to *4*, and alignment to *Center* (see Figure 5.6).

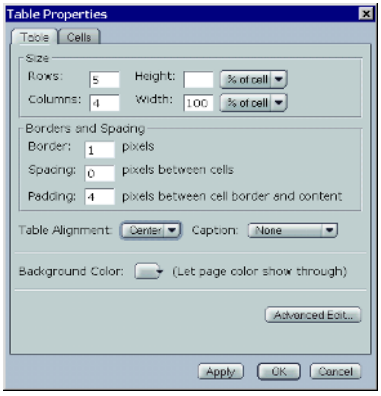


Figure 5.6 Setting up a table for pieces of information.

Enter the text as shown below. Click and highlight the entire top row. Click the Bold icon to make these entries appear as column headers.

To add one last touch, you can center the headings. With the top row still highlighted, click the Center icon.

Save and test in your browser.

Using FrontPage Express

Open *sidebar_c1_1.html* in FrontPage Express. You will find the one-cell table holding the text you entered earlier.

```
"Example Agenda The example agenda
below incorporates all the elements
necessary to make an agenda
effective:"
```

Below this add the text:

```
January Staff Scheduling Meeting


January 15, 2001

3rd Floor Conference Room

9:00 AM to 10:45 AM

Participants: Bill, Mary, Sue, George

Note - Please bring last month's
overtime records.
```

This will give you ample text to learn some typesetting techniques.

Add Another Table

Place your cursor at the top of the page and insert another table. Click the Table icon. When the Table selector opens, click and drag over the two upper left cells (see Figure 5.7).

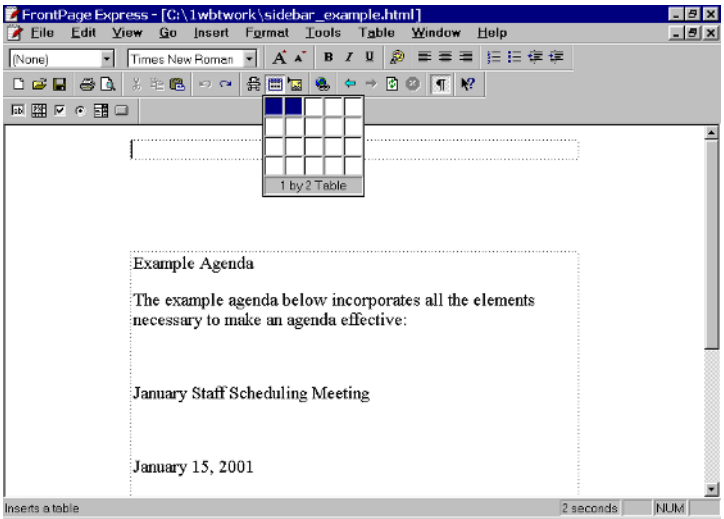

FrontPage Express - [C:\1wbtwork\sidebar_example.html]
File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
1 by 2 Table
Example Agenda
The example agenda below incorporates all the elements necessary to make an agenda effective:
January Staff Scheduling Meeting
January 15, 2001
Inserts a table
2 seconds
NUM

Figure 5.7 Adding a table.

Now fine-tune your table a bit. Right-click in the new table and go *Table Properties*, and set Cell Spacing to *0*, Cell Padding to *10*, and Spacing to *10*. Click *OK*. Now you have a new table at the top of the page. It is separated from the old table by a line of space. You will learn why this is important in Chapter 6 (about color).

Add an Image

Make the text look better by adding a trademark image that will appear at the top of each page. Place your cursor in the left cell of

the new table. Click on the Image icon. The Image window will open. Enter *media/fscb4.jpg* for the URL. Click *OK*, save, and test your work in the browser (see Figure 5.8).

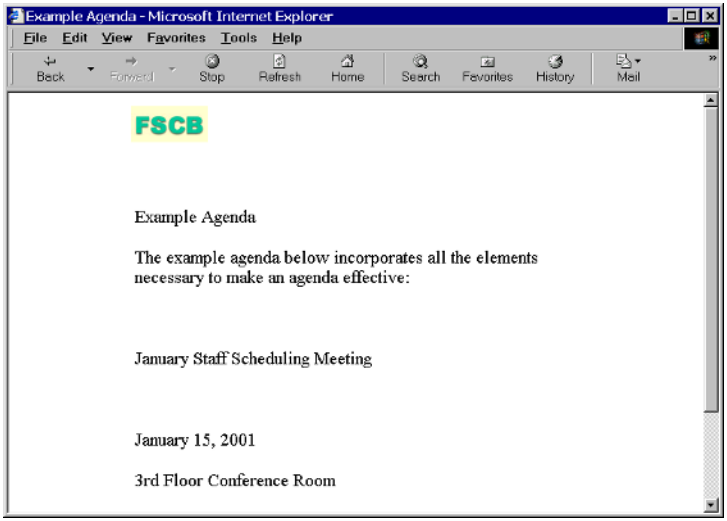

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
FSCB
Example Agenda
The example agenda below incorporates all the elements necessary to make an agenda effective:
January Staff Scheduling Meeting
January 15, 2001
3rd Floor Conference Room

Figure 5.8 FSCB image in table, in browser.

The image looks okay, but not quite as good as it could. Chapter 6 shows how to change the background color of the table to match the yellow in the image.

Bold and Italic

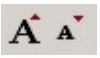
In the first sentence, highlight the word *necessary*. Click on the italic icon.

The word will change to italic type. Highlight the word *effective*. Click on the bold icon.

The word changes to bold. (Note that this is not a correct use of bold but will suffice for an illustration.)

Change Type Size

Highlight the words *January Staff Scheduling Meeting*. Click on the type size decrease icon (on the right).



The type size will decrease one increment. (Click on the type size increase icon, on the left, and the type size will increase one increment.)

Change Typeface (Font)

Highlight the word *elements*. Go to the typeface window to the left of the increase and decrease size icons. Click on the arrow (see Figure 5.9).

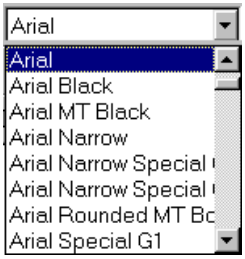


Figure 5.9 Changing the typeface.

Select the typeface Arial. The word now appears in the Arial typeface (font).

Headings

You learned how to make HTML headings in Chapter 2 (headings set at level 3). Using the HTML headings is a good practice (levels 1-6). But there is another way to create headings. Increase the type size of the heading and make it bold. Put a line space above and below by pressing the *Enter* key. Use this technique to make "Effective Agendas" a heading and also "January Staff Scheduling Meeting."

Centering

Place the cursor on the heading "January Staff Scheduling Meeting," then click on the center alignment icon. This centers the heading. Normally you don't center headings, but you do center titles.

Bulleted Lists

Place the cursor at the end of the sentence that starts "January 15, 2001." Delete the hard return so that 3rd Floor Conference Room now appears on the same line. Do the same for the following two lines. Now what was four lines is now one. Place the cursor between 2001 and 3rd Floor. Click on the bulleted list icon.

Move the cursor to the break points between each line. Now every time you press Enter a bullet will appear at the start of the line. Test the result in your browser (see Figure 5.10).

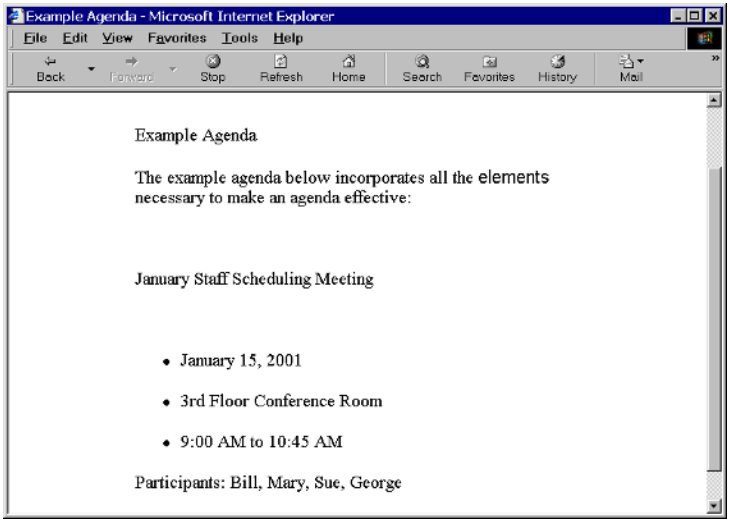

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Example Agenda
The example agenda below incorporates all the elements necessary to make an agenda effective:
January Staff Scheduling Meeting
January 15, 2001
3rd Floor Conference Room
9:00 AM to 10:45 AM
Participants: Bill, Mary, Sue, George

Figure 5.10 Bulleted list.

This may seem awkward at first. FrontPage Express cannot place bullet points on lines that are separated by the <*br*> markup. By deleting the <*br*> markup you can create bulleted lists.

Rules (Horizontal Lines)

Place the cursor before the sentence that ends "an effective agenda." Go *Insert*, *Horizontal Line*. This inserts a rule separating this last paragraph from the remainder of the text.

Numbered Lists

Place the cursor in front of the first participant, "Bill." Click the numbered list icon.

Do the same for the remaining participant list. Delete the commas that follow each name. Test the result in your browser (see Figure 5.11).

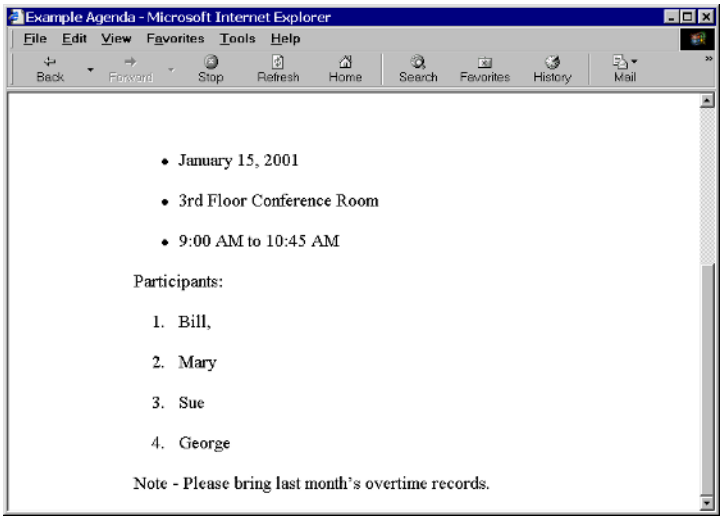

Example Agenda - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
January 15, 2001
3rd Floor Conference Room
9:00 AM to 10:45 AM
Participants:
1. Bill,
2. Mary
3. Sue
4. George
Note - Please bring last month's overtime records.

Figure 5.11 Numbered list.

Tables for Organizing

Tables are effective devices to organize pieces of information. The Effective Agendas sidebar Web page can use a table in this fashion to organize the example agenda.

Place the cursor at the end of the sentence "Note - Please bring last month's overtime records." Insert a table with the *5* rows and *4* columns. Set the Border to *1*. Click *OK*. To set further properties for the table, right click in the table and go *Table Properties*. Set the Border to *1*, Cell Spacing to *0*, Cell Padding to *4*, and alignment to *Center* (see Figure 5.12).

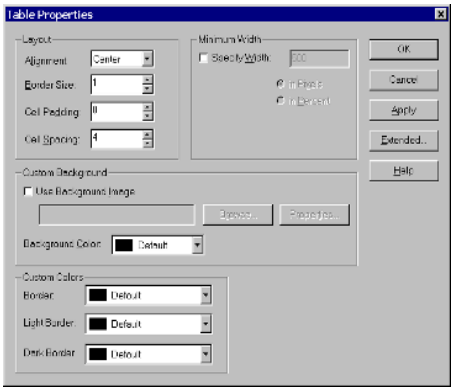


Figure 5.12 Setting up a table for pieces of information.

Enter the text as shown below. Click and highlight the entire top row. Click the Bold icon to make these entries appear as column headers.

To add one last touch, you can center the headings. With the top row still highlighted, click the Center icon.

Save and test in your browser (see Figure 5.13).

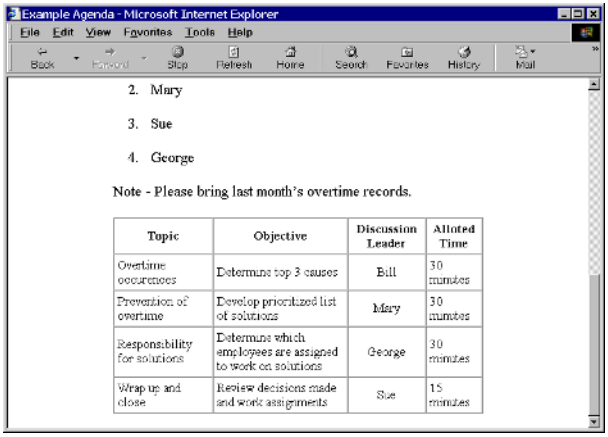


Figure 5.13 A table showing pieces of information.

Summary

Old tradition and new media. Typography and the Web. Alas, we might like to do something different to celebrate our new technology. But text is valuable, and text must be readable. Thus, we need to rely on the 500-year-old print technology for readability. Follow the rules of typography as you learned with desktop publishing to make your text readable in your WBT presentation. If you never learned desktop publishing, you need get up to speed on it.

Layout is important too. Make readable text columns with the proper width for type size. To do so, put the text in tables with invisible borders. Typography and layout for the Web are not difficult to employ, and their sensible use can give your WBT training presentation a polish that benefits your students substantially.

This Page Intentionally Left Blank

6

Color and Images

Color can brighten Web pages full of text and make them more readable. Color images are the spice of the Web and will be the spice of your WBT presentation too. Long gone are the days of text-only Web presentations (e.g., the Lynx text-only Web browser circa 1992–94). But you don't have to go crazy with zany colors or animated images. You need include only images that support and illustrate your WBT presentation and make it attractive.

Color

Using color in WBT presentations is sometimes a matter of fitting in with or adhering to your organization's graphic design standards. While neon orange might have great visual appeal, it won't do if your company colors are blue and green. Work within the design standards your organization has in place, but also use color to improve readability.

If you have no design standards or organizational colors with which to conform, it's all up to you. Keep in mind, however, that the use of color is a matter of good taste. Make your color choices carefully.

Text and Background

It is important to optimize the readability of WBT presentations. Readability is improved by using contrasting text and background colors. While it may seem best to use the most obvious (i.e., black text on a white background), this has drawbacks. Using a white background for Web pages can cause eye fatigue if much reading is required. As most WBT presentations require reading, you need to use text and background color combinations that are easy on the eye and have a pleasant appearance.

Determining what comprises a pleasant-looking combination of text and background colors is not only a matter of good taste but a matter of recognizing cultural norms. If your WBT presentations have an international audience, your task is potentially bewildering, as you must consider the color norms of many cultures. If your WBT presentation is targeted to an audience that is outside the country, you need to research color in the cultural context of your target markets.

Using your best judgment combined with user testing, you can discern a usable combination for a text and background color. Table 6.1 provides a few well-proven examples that may be helpful getting you started.

Table 6.1 Common Color Combinations

	Text Color	Background Color
Monochrome Monitor	green	black
Monochrome Monitor	yellow	black
Word for Windows (alternative)	white	dark blue
WebTV	light colors	black
One Author's Choice	black	medium green
Used by Many	black	light grey
Also Used by Many	black	medium grey

Light colors on black seem to work (e.g., monochrome monitors and WebTV), but some people find a black background a little overwhelming. Your best bet is probably black type on a pastel background. Bright colors like yellow and red don't make good backgrounds and may cause even more eyestrain than white. A mauve background for a masculine WBT presentation may not work well. Likewise, a navy blue background for a feminine WBT presentation may not work well.

Consistency in Color Use

You need to use consistent colors. Students may become confused when text or background colors change from page to page. Use a change in colors to indicate a different section of your WBT presentation or perhaps a sidebar or footnote.

The only way to control color from one student to another is to use browser-safe colors that you can depend on to look the same for all browsers.

Browser-Safe

Although your computer and monitor may be capable of displaying 16 million colors, limit the colors you use to the browser-safe palette of 216. This will ensure that even users with computers capable of displaying just 256 colors can effectively view your WBT presentations. These specific 216 colors are common to all web browsers (both PC and Mac).

Don't worry, it's easy to design great WBT presentations with just browser-safe colors. Composer makes it easy by providing a color chart from which to choose. FrontPage Express requires that you use a numerical designation for browser-safe colors.

RGB

FrontPage Express and most image editing software use the RGB (Red Green Blue) system of designating colors. A computer monitor really only displays varying intensities of red, green, and blue to produce every other color. To determine RGB color, each color is assigned a value of 0 to 255 for the three colors a monitor can produce, red, green and blue. Together this determines what is seen on the monitor. Table 6.2 illustrates some common RGB color designations.

Table 6.2 RGB Color Designations

RGB	Red	Green	Blue	Yellow	Grey	Black	White
R	255	000	000	255	102	000	255
G	000	255	000	255	102	000	255
B	000	000	255	000	102	000	255

Examples of other normal colors are powder blue (153,204,255), pastel green (204,255,204), rose (255,255,204), and cream (255,255,204). A simple means exists to set you straight about browser-safe colors. Remember that any colors are browser-safe

that are designated exclusively with a combination of the following RGB numbers.

000, 051, 102, 153, 204, 255

Hexadecimal

To further complicate things, the Web pages require the use of a different color designation system called hexadecimal, or *hex* for short. Composer conveniently adds the hex designation for browser-safe colors as you build your web pages. Open Composer and click the bottom part of the color icon.

The Page Background Color window will open. You will see a color chart with 70 browser-safe colors from which to choose. Click on the bright blue swatch three up and three across from the lower right. The Hex color designation #3333ff will appear in the color designation box. (see Figure 6.1).

Figure 6.1 Page Background Color window.

While FrontPage Express uses the RGB color system, it automatically converts it to hex. When you view the HTML generated by FrontPage Express you won't see a RGB number, but the hex number in the body markup tag:

```
<title>WBT Presentation</title>
</head>
<body bgcolor="#0000ff">
</body>
```

If you learn HTML and design your WBT presentations without the aid of Web authoring software, you will need to ensure you use only hex colors that are browser-safe. Here you can see the hex numbers that are the equivalents to the RGB browser-safe numbers:

RGB = Hex

000 = 00

051 = 33

102 = 66

153 = 99

204 = cc

255 = ff

Using Hex color designations isn't hard at all. Table 6.3 shows the same colors in Hex as Table 6.2 did for the RGB system.

Table 6.3 Hex Color Designations

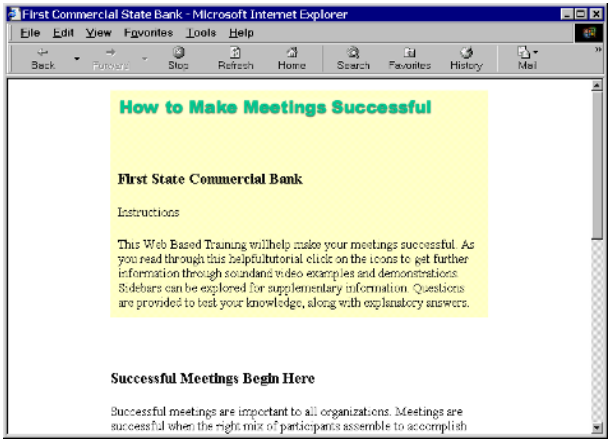
Hex	Red	Green	Blue	Yellow	Grey	Black	White
Red	ff	00	00	ff	66	00	ff
Green	00	ff	00	ff	66	00	ff
Blue	00	00	ff	00	66	00	ff

Examples of other normal colors are powder blue (99ccff), pastel green (ccffcc), rose (ffcccc), and cream (ffffcc).

Colors in Composer

To set text and background colors in Composer is easy. For practice, let's try it with the Meetings WBT tutorial. Open the file *mywbt.html* in Composer. Make certain the cursor is inside the table you created. Click the bottom part of the color icon.

The Table or Cell Color window will open. A pastel yellow will work well for this background. From the top row of swatches select the fifth from the left. Make sure the Background for Table option is selected. Click *OK* and test in the browser. The table now has an attractive yellow background (see Figure 6.2).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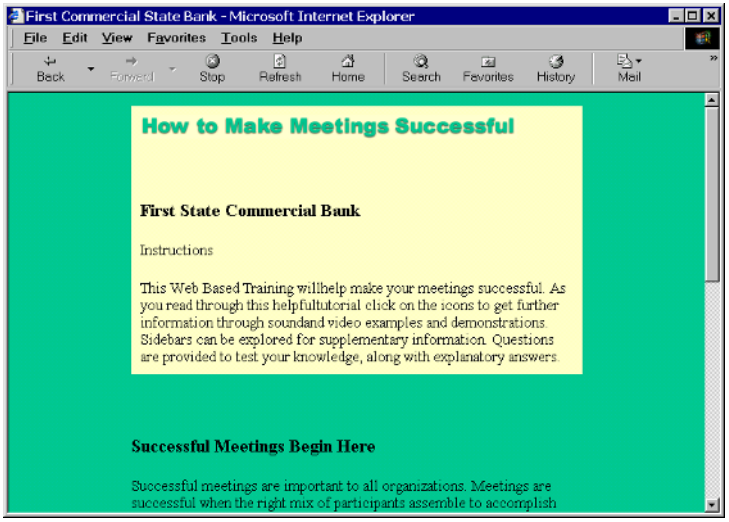
Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish

Figure 6.2 Table background in browser (shows as grey in this book).

Now click the top part of the color icon to set text color. The Text Color window will open. A dark red for text will contrast nicely with the pale weak yellow background. Select the red swatch in the second column, third from the bottom. Click *OK* and test in the browser. The text is now changed to dark red.

Take your skill in using color contrast one additional step by changing the page background to a medium green. To change page background color, make certain the cursor is outside the table by clicking at the very top of the page. Click on the bottom of the color icon to select background color. Using Composer's color chart gives you 70 colors from which to choose, but the medium green is not a color displayed on the chart. Type the Hex number *00cc66* in the box at lower left in the Color window. Click *OK* and test in the browser (see Figure 6.3).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Successful Meetings Begin Here
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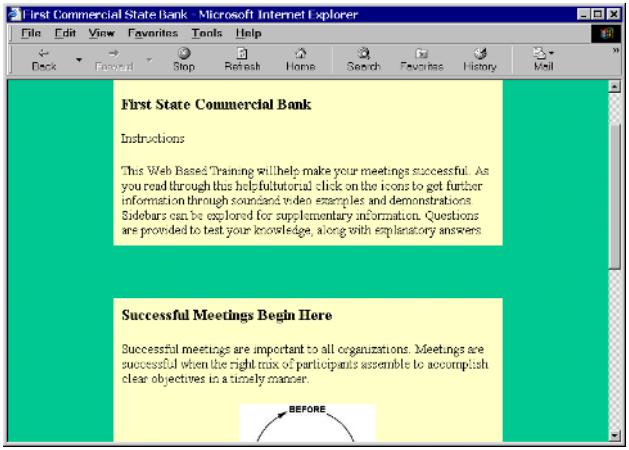
Figure 6.3 Page background in browser (shows as a dark grey in this book) with one table for text (shows as white in this book).

You now have contrast between the text and its immediate background as well as contrast between the table and the rest of the page. As you create more tables in this same Web page, you can make them stand out as individual pieces of content, if desired (see Figure 6.4).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Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.
BEFORE

Figure 6.4 Page background in browser (shows as dark grey in this book) with two tables for text (shows as white in this book).

Colors in FrontPage Express

To set text and background colors in FrontPage Express you need to know the RGB number for browser-safe colors. For practice let's try it with the Meetings WBT tutorial. Open the file *mywbt.html* in FrontPage Express. Highlight the entire body of text. Click on the color icon.

Click on the *Define Custom Colors* button. Click on a blank (white) box under Custom colors. To select dark red, enter these RGB numbers.

Red = 153, Green = 000, Blue = 000

Click on the *Add to Custom Colors* button. Your color will appear in the blank box and will be selected. Click *OK*. The text is now dark red.

A pastel yellow will make a background that contrasts nicely with the dark red text. To set the Table background color, go *Table*, *Table Properties*, *Background Color*, click on arrow, and select *Custom*. You will get the color chart. To select pastel yellow enter these RGB numbers.

Red = 255, Green = 255, Blue= 204

Click *OK* and test in the browser. The table background is now pastel yellow contrasted with dark red text. (see Figure 6.5).

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Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 6.5 Red text on yellow in browser (shows as two shades of grey in this book).

Take your skill in using color contrast one additional step by changing the page background to a medium green. To change page background go *Format*, *Background*, click on Background arrow, and select *Custom*. You will get the color chart. To select medium green enter these RGB numbers.

Red = 000, Green = 204, Blue= 102

Click *OK* and test in the browser. You now have contrast between the text and its background as well as contrast between the table and the rest of the page. As you create more tables in this same page, you can make them stand out as individual pieces of content, if desired (see Figure 6.6).

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Successful Meetings Begin Here
Successful meetings are important to all organizations. Meetings are successful when the right mix of participants assemble to accomplish clear objectives in a timely manner.

Figure 6.6 Page background in browser (shows as darker grey in this book) with two tables (shows as light grey in this book).

Design Elements

Elements such as borders, buttons, and logos need to fit with the text-background color scheme. This book doesn't attempt to teach you color design, but there are many excellent books on Web design that can help you with your color choices. Peach Pit Press, for example, publishes excellent design books.

Clip art collections now include design elements that are optimized for use on the Web. Many of these have hundreds or thousands of images from which to choose. With all this available, you can easily overdo it! Keep the Web pages in your WBT presentation clean and simple.

Image Preparation

Illustrations make a nice addition to any type of education or training, and they do for WBT presentations too. From full-color photographs to simple text images, all need preparation for use on the Web. There are a multitude of techniques that you can use to optimize images, so many in fact that people devote careers to doing this type of work. But we'll cover just a few of the techniques you can use to put high-quality images in your WBT presentations. You can accomplish this with free or inexpensive image editing software.

Web Image Formats

Web browsers display three image formats, each of which has different characteristics. The two most common are Graphics Interchange Format (GIF) and Joint Photographic Experts Group (JPEG). There is also a newer format beginning to gain popularity called Portable Network Graphic (PNG).

GIF

Most images are too large in their native format to download quickly on the Web. A GIF image file automatically compresses its image, making it more efficient to download. Compressing the file reduces the file size, but there is no loss of image; and the image retains its pixel dimensions. A GIF image contains only 256 colors (8-bit color) and can't agilely display complex fades or blends. GIF files are best for simple images such as color page trimmings.

Photographs

Photographs require at least 8-bit color (256 colors) to look real. However, photographs look much better with more colors (e.g., 16-bit color yields about 64,000 colors and 24-bit color yields about 16 million colors).

JPEG

JPEG image files aren't necessarily small and don't necessarily download quickly. Use the JPEG format for more complex images such as digital photographs. Most image editing software will enable you to manually compress a JPEG image. However, the compression in this case is "lossy." That is, the more you compress the image file, the more quality you lose. Some experts claim that you can get up to 10:1 compression without losing noticeable quality. It really depends on the image, however, and you need to experiment on a case-by-case basis.

PNG

PNG image files were developed as a Web standard to replace GIFs, a pre-Web standard. Expect PNGs to grow in popularity. The standard was designed specifically to be a network image for-

mat and will provide a great deal of flexibility in the future as creating and editing images for the Web becomes simpler yet more sophisticated.

You may have access to many other image formats and would like to use them in your WBT presentations. This can be accomplished by converting them to a Web image format by opening them in an image editor, then saving in JPG, GIF or PNG format. Just use the *Save As* function.

Image Editors

Image editors give you the capability to manipulate the images you incorporate in your WBT presentations. Even the most basic (and inexpensive) programs have the capability to make your images Web-ready. Some of the more advanced (e.g., Adobe Photoshop) are capable of image wizardry and can take years to master. This chapter focuses on basic image editing tools that are free or inexpensive. But if your organization has preferred software for this purpose, check that out first.

An image editor needs to have the capability to do certain basic tasks. These tasks are:

Change the contrast

Change the brightness

Crop the image

Resize the image

Add text

Convert image file formats

You can spend hours playing with the processes enabled by image editing software. Especially cool are filters that produce artistic effects such as an oil painting look or a mosaic tile appearance.

Presumably, though, if you want something artistic, you will hire a digital artist. But you don't need a digital artist to use the processes mentioned.

Use IrfanView for the exercises in this chapter. It's a capable freeware image editor. It will get you started on image editing, but you may outgrow it after you gain experience. The one task IrfanView cannot perform is to create text. For this task, we use JASC Paint Shop Pro.

Edit an Image

We've included a sample image to edit on the CD included with this book. You can use it to practice basic tasks in preparing an image for the Web. It's a digital color photograph named *snack_edit.jpg,* and you can find it in the *media* folder.

Edit Smart

You are likely to spend a lot of time and effort to make your images look just the way you want them. To protect this investment, there are several things you can do to make your image editing process more efficient.

- Keep all your images in the subfolder *media* under your project folder *1wbt*. This prevents wasted time looking in various folders for your work. When the time comes to embed images in your WBT presentations, they will be there ready to use.
- Never edit the original version of an image. Always work with a copy of the original in case you save changes you later want to undo. Editing an image for final use on the Web may require several iterations. While you can view the direct results of your work while the image is opened in the image editor, you may change your mind after embedding it in a

Web page. A practice that helps track changes is to name the files with consecutive name-number combinations. For our snack image, save as snack1.jpg, snack2.jpg, snack3.jpg, and so forth.

- Take brief notes on the settings you use for different versions of an image. You may find that a certain contrast setting works well in all versions, and you can use it as a standard in the future. This is especially important when editing takes place in more than one sitting. It's easy to forget what a setting was.

Contrast

Changing contrast can improve the overall look of an image by making it look sharper. Increasing contrast reduces the continuum of colors between the brightest and darkest colors in the image. Boosting contrast too much results in a surrealistic look that is unappealing.

Use IrfanView to open *media/snack_edit.jpg*. To adjust contrast go *Image*, *Enhance colors*, and the Enhance Colors window will open. Experiment by dragging the Contrast slider. Results will appear in the New Image frame at the upper right (see Figure 6.7). Too much contrast gives you a surrealistic look. Negative contrast gives a dull look.

Adjusting the brightness affects the contrast. This makes sense, because contrast is the difference between the brightest and darkest colors. Because of this you will need to make small adjustments in brightness. Experiment, and make the image look better.

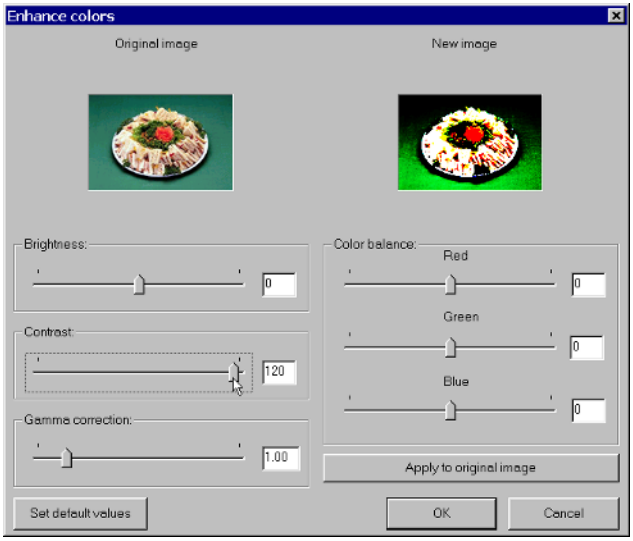

Figure 6.7 Enhance colors window.

Brightness

Increasing brightness makes an image brighter, but too much brightness makes it look washed out. Some images look better when you decrease brightness by a small amount. Try this with our *snack_edit.jpg* and judge for yourself.

Use IrfanView to open *media/snack_edit.jpg*. To adjust brightness, go *Image*, *Enhance colors*, and the Enhance Colors window will open. Experiment by dragging the Brightness slider. Results will appear in the New Image frame at the upper right (see Figure 6.8). Too much brightness will give you a washed-out look. Negative brightness often gives you richer colors.

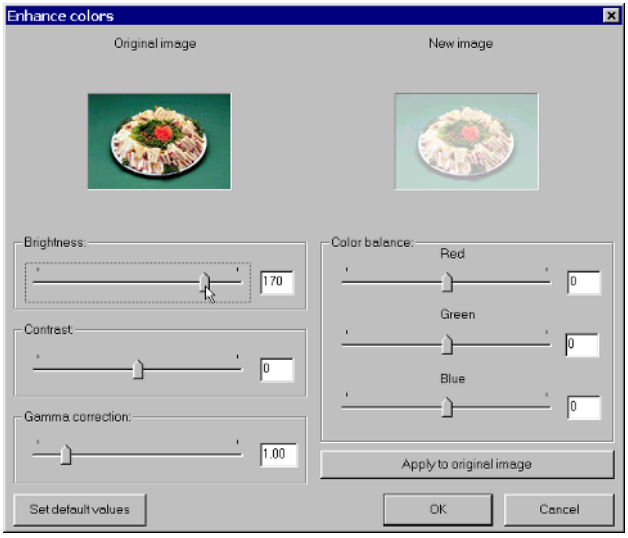

Figure 6.8 Enhance colors window.

Again, you need to coordinate your brightness adjustments with your contrast adjustments to make the image look better.

Cropping

Cropping is simply trimming your image to present an optimal frame. You can crop a lot or just a little bit. The object is to frame only the part of the image that you want and to trim the remainder away.

Use IrfanView to open the file *media/snack_edit.jpg*. You will see the snack tray is on a green surface, and this surface comprises over a third of the image. Cropping away just a small strip will make the image look a little better and will result in a slightly smaller file size. Place the cursor in the upper left corner of the image, then click and drag to the lower right. The area outside the

frame will be deleted, and the area inside the frame retained (see Figure 6.9).

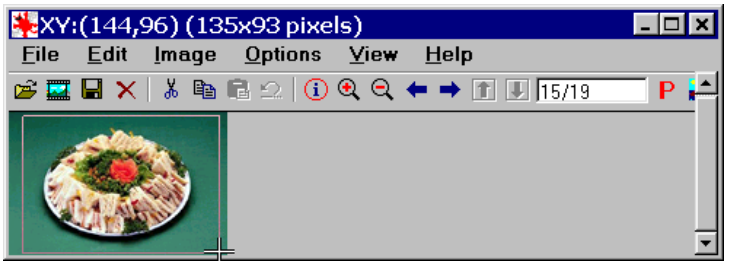

Figure 6.9 Setting the cropping frame.

It takes a little practice to perfect your cropping. To reset the frame, click once on the image. The frame will disappear, and you can try again. When you are satisfied with your crop, go *Edit*, *Crop*. The newly cropped image will display (see Figure 6.10).

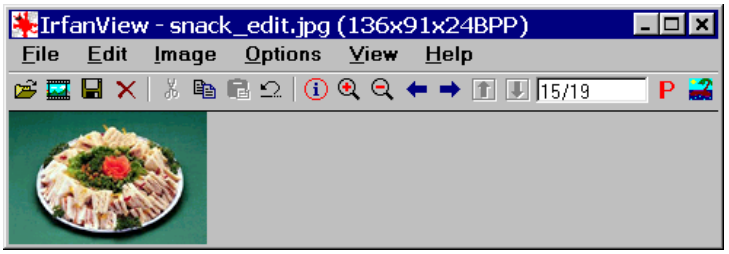

Figure 6.10 Cropped image.

Resizing

When planning your WBT presentations, you may remember you have images from existing training materials that are potentially useful. These will often be much larger than needed on the Web.

In this case, you need to resize them from their large size to a more suitable, smaller size. This downsizing operation works well.

Enlarging from small to large almost never works. Lines and detail become fuzzy, and the image starts showing pixels. Find another image to replace a small one rather than try to enlarge the small one.

Use IrfanView to open *media/snack_edit.jpg*. For the Meetings WBT tutorial images, a width of 125 pixels work well. To resize to this dimension, go *Image*, *Resize/Resample* for the Resize/Resample image window. Make sure the *Preserve aspect ratio option* is selected. Enter *125* for Width (Height will automatically be entered) and click *OK*. The reduced image will display (see Figure 6.11).

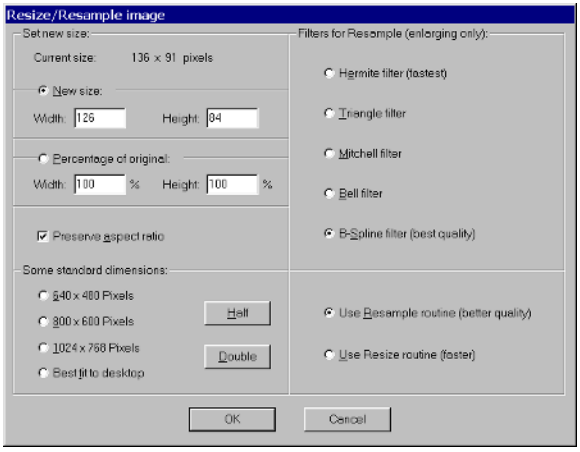

Figure 6.11 Reduced image.

Go *File*, *Save As*, and name this reduced image as *snack_125.jpg* in the folder named *media*. Use it in the next section on sharpening.

Sharpen

Some image editors include a function called "Sharpen." Using this function may eliminate the need to make multiple adjustments in an image's contrast and brightness. If your image editing software has this function, try it.

Use IrfanView to open *media/snack_small.jpg*. On close inspection, you can see that during the resizing process the image became a little fuzzy. To improve the appearance of the image, go *Image*, *Sharpen*. The image presumably becomes clearer and crisper. You can reverse this process by using *Edit*, *Undo*. The image will revert to its original state.

Making Text Images

You can make logos, titles, and banners into text images rather than using HTML text. Because you can count on website visitors having only Times New Roman (Times), Arial (Helvetica), and Courier, you will need to make text images to use any other fonts. In other words, text images make up for the limitations of HTML typography in Web pages.

You can use most image editors to create text images. IrfanView does not have a text function, so we used Paint Shop Pro 5.0 to make text images. If you don't have Paint Shop Pro, you can follow along and learn the basics. The procedure is much the same for all image editors. In this exercise, you will create the logo for the Meetings WBT tutorial. Open Paint Shop Pro and click on the top of the color icon. The color generator window opens (see Figure 6.12).

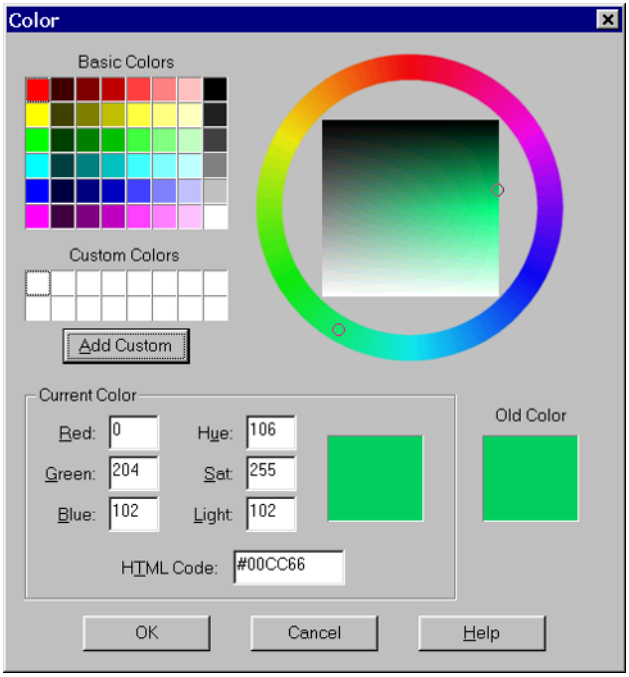

Figure 6.12 Color window.

Enter *#00cc66* in the HTML Code box and click *OK*. This sets the foreground color to medium green. Click on the bottom of the color icon and repeat the process, using *#ffffcc* to set the background color to pastel yellow. This process sets the colors to be used in creating the text image.

Now go *File*, *New* and set the dimensions to *85* by *40* pixels, Background color to *Background Color*, and Image type to *16.7 Million Colors* (24 Bit). Click *OK* and a new blank image will appear (see Figure 6.13).

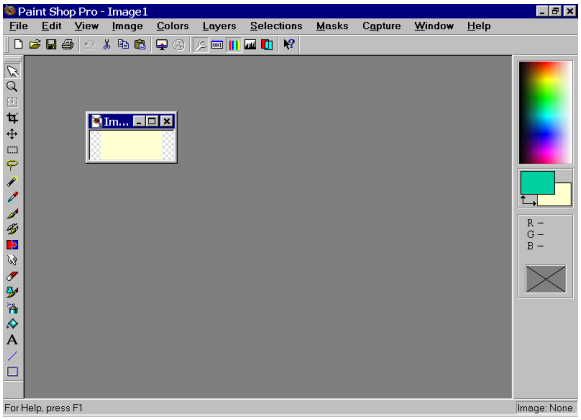

Figure 6.13 Blank image.

Click on the text icon in the toolbar on the left of the screen.

Place the cursor in the middle of the new image and click. The Add Text window will open. Select *Arial Black*, *Regular*, *20*, and type *FSCB* in the box at the bottom (see Figure 6.14).

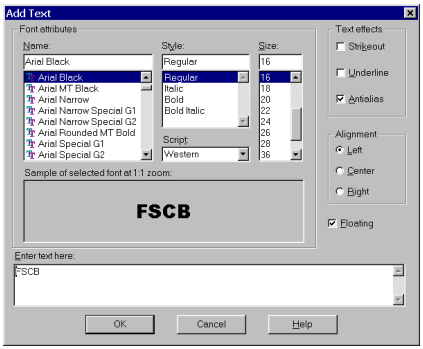

Figure 6.14 Add Text window.

Click *OK,* and the new text will appear in the image with a surrounding frame. The frame indicates the text is selected, and you can move it by dragging. Center the text in the image. Once you are satisfied with the location of the text, deselect it by going *Selections*, *Select None*. Go *File*, *Save As*, *Save As Type*, *JPEG – JFIF Compliant (*.jpg, *.jif, *.jpeg)*. Browse to the folder *1wbt/media*, name the file *logo.jpg*, and click *Save*.

Fancy

You can add artistic effects to your type. For a drop shadow effect, do your text in black or dark grey. Then do it again (identically) in a brighter color. Move the bright text over the dark text so that the dark text shows just slightly below and to the right.

You have created a drop shadow!

Icons and Design Elements

Designing anything but the simplest of icons or buttons is work for a digital artist. Icons for functions and navigation need to be clear. If you use icons as design elements, keep things simple. A small square image with the letter *I* can indicate a link to *instructions*. Another with the letter *G* can indicate a link to a *glossary*. Use a legend to describe the purpose of each icon and keep the number of unique icons as small as possible.

Design elements can make Web pages look better. If you can't afford to employ a digital artist, look to commercially available Web clip art on CDs. Keep your design elements simple to project

a professional look. Just a few well-placed design elements can provide a professional appearance. Don't go overboard.

To create simple design elements, use an image editor; create geometric shapes; fill them with color; and incorporate them into your WBT presentations.

Summary

What originally made the Web different from other Internet protocols was the capability to display images and control color. And the Web fueled the Internet explosion. Use color and images to give your WBT presentations the aesthetic appeal of a fine magazine. It's Web tradition.

Controlling color in Web pages and in tables is simple to do. Using and editing color photographs is also easy. Creating appealing color artwork, and for some purposes creating photographs, are the realms of digital artists and professional photographers. But when you obtain such art work, you can easily adapt it to a Web page.

Don't overlook opportunities to include color and images in your Web pages. Besides having aesthetic appeal, they help break up potentially tedious text sections.

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7

Navigation and Menus

Easy navigation is a must for professional WBT presentations. Your WBT presentation will be a disaster if a student can't move easily through it. Navigation menus provide a practical means by which to navigate Web pages. Well-designed navigation menus serve students much better than randomly placed links or icons. Imagemaps can also provide easy navigation. One image can accommodate multiple links to multiple Web pages. This chapter will cover both of these navigational devices.

Using Tables for Menus

We use a navigation menu to move from chapter to chapter. The design of the meetings WBT presentation includes the menu at the top and at the bottom of each chapter for convenience. If the menu were large, this would not be practical. When developing WBT presentations, review your content and decide what your navigation menu should look like and where to place it.

One Row, Multi-Column

Use a table with one row and multiple columns that can be placed at the top or bottom of a Web page. Note that the Meetings WBT tutorial uses this style of navigation menu.

Composer

In Composer, open the file *mywbt.html*. We will place a table at the top of the page to hold both the text image logo you created in Chapter 6 and the navigation menu. To create space for this table, place the cursor at the top of the page and press *Enter* three times.

Click on the table icon and enter *1* for Number of rows, *2* for Number of columns, *500* for Table width, *0* for Border Width, and click *OK*. You still need to modify the properties of the table. To change properties go *Table*, *Table Properties,* and enter *0* for Spacing, *10* for Padding, *Center* for Table Alignment, and *#ffffcc* for background Color. See the table in Figure 7.1.

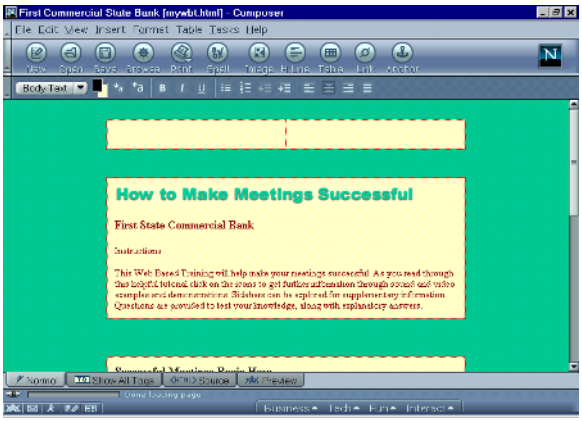

First Commercial State Bank [mywbt.html] - Composer
File Edit View Insert Format Table Tasks Help
How to Make Meetings Successful
First State Commercial Bank
Instructions

Figure 7.1 A 1-row, 2-column table 500 pixels wide.

Place the cursor in the left cell and click the image icon. The Image Properties window will open. Enter *media/fscb.jpg* for the Image URL and click *OK*. The table now has the FSCB logo in the left cell and is ready for the navigation menu in the right cell. See the table in Figure 7.2.

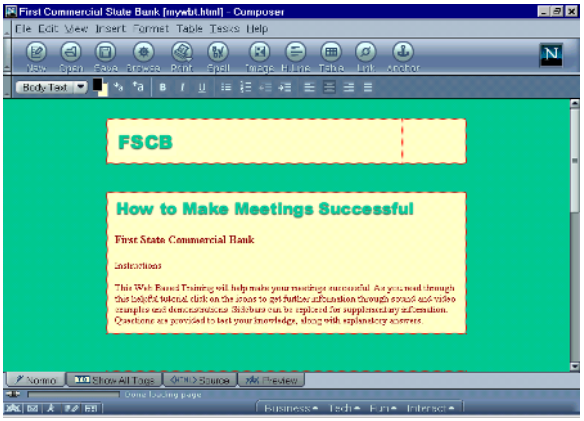
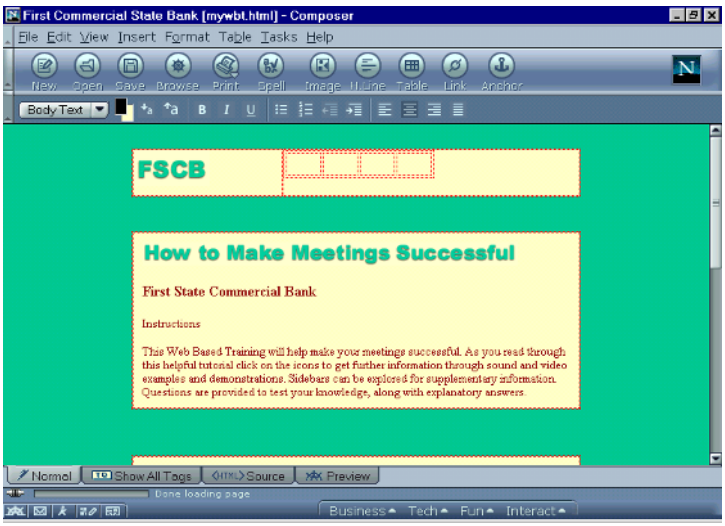

First Commercial State Bank [mywbt.html] - Composer
File Edit View Insert Format Table Tasks Help
FSCB
How to Make Meetings Successful
First State Commercial Bank
Instructions

Figure 7.2 A 1-row, 2-column table with logo at left.

Place the cursor in the right cell, then go *Table*, *Insert*, *Table*, and enter *1* for Rows, *4* for columns, *170* pixels for Width, *0* pixels for Border, and click *OK*. The table for the navigation menu now appears as shown in Figure 7.3.


First Commercial State Bank [mywbt.html] - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image H Line Table Link Anchor
Body Text
FSCB
How to Make Meetings Successful
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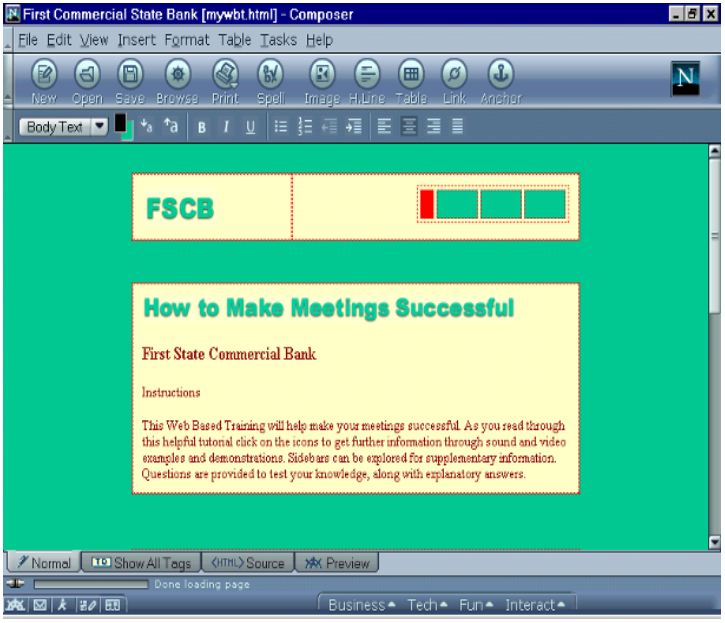
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars can be explored for supplementary information. Questions are provided to test your knowledge, along with explanatory answers.
Normal Show All Tags Source Preview
Done loading page
Business Tech Fun Interact

Figure 7.3 A 1 row, 2-column table with a table inside right cell.

Further formatting will help this table work better as a navigation menu, and changing the background color of each cell will improve functionality.

Place the cursor within the cell at far left in the new table. Go *Table*, *Table Properties*, and set Spacing to *3* pixels, Padding to *3* pixels, and Table Alignment to *Right*. Click the *Cell* tab and select red (*#ff0000*) for Cell Background Color, and click *OK*. Click *Next* to go to the next cell in the table. Set the Background Color for this and the remaining two cells to medium green (*#00cc66*). In this navigation menu, the cell with the background color red will indicate the current Web page. Green will indicate other pages not selected (see Figure 7.4).


First Commercial State Bank [mywbt.html] - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image H.Line Table Link Anchor
Body Text
FSCB
How to Make Meetings Successful
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Normal Show All Tags Source Preview
Done loading page
Business Tech Fun Interact

Figure 7.4 Table with cell background colors changed.

To finish the navigation menu, the text will need to be placed in each cell and linked to appropriate Web pages. Type *Introduction* in the red cell. Type *1* in the next cell, *2* in the next, and *3* in the last. Create links from 1, 2, and 3 to *chapter1.html*, *chapter2.html,* and *chapter3.html*, respectively. Highlight the text and click the Align Center icon and the Bold icon to make the text stand out more. Now you have an attractive navigation menu that can be reused on any page in the Meetings tutorial. Save and preview in the browser (see Figure 7.5).

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Address C:\1wbtwork\mywbt.html
Go
FSCB
Introduction 1 2 3
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars canbe explored for supplementary information. Questions are providedto test your knowledge, along with explanatory answers.

Figure 7.5 Complete navigation menu.

To reuse this navigation menu on another Web page, simply change the background color in the table for the currently open page and eliminate the hyperlink. (A link that links the page to itself is inappropriate. The red background indicates the current Web page and does not have a link.) In this example for Chapter 1 of the tutorial, you can see that the second cell with *1* is now red, and *1* is not linked to another Web page. The first cell now has *Introduction* linked to *index.html*, and the cell background color has been changed from red to green (see Figure 7.6).

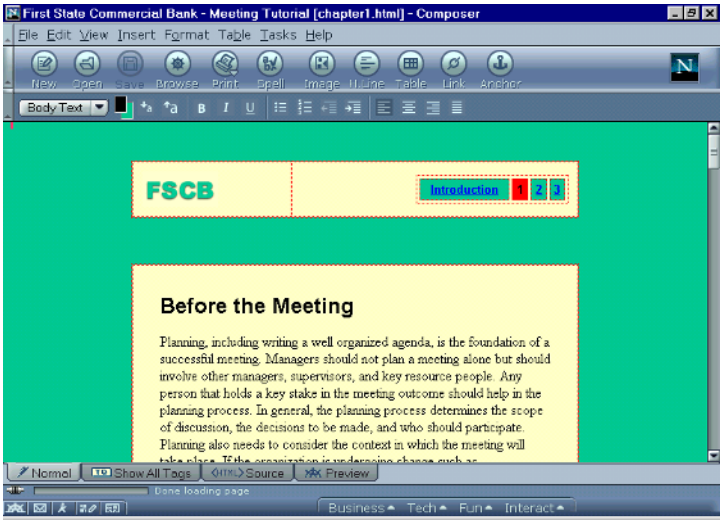
First State Commercial Bank - Meeting Tutorial [chapter1.html] - Composer
File Edit View Insert Format Table Tasks Help
New Open Save Browse Print Spell Image HLine Table Link Anchor
Body Text
FSCB
Introduction 1 2 3
Before the Meeting
Planning, including writing a well organized agenda, is the foundation of a successful meeting. Managers should not plan a meeting alone but should involve other managers, supervisors, and key resource people. Any person that holds a key stake in the meeting outcome should help in the planning process. In general, the planning process determines the scope of discussion, the decisions to be made, and who should participate. Planning also needs to consider the context in which the meeting will
Normal Show All Tags Source Preview
Done loading page
Business Tech Fun Interact

Figure 7.6 Navigation menu for *chapter1.html*.

FrontPage Express

Use FrontPage Express to open *mywbt.html*. We will place a table at the top of the page to hold both the text image logo you created in Chapter 6 and the navigation menu. To create space for this table, place the cursor at the top of the page and press *Enter* three times.

Go *Table*, *Insert Table*, and enter *1* for Number of rows, *2* for Number of columns, *Center* for Alignment, *0* for Border, *10* for Cell Padding, *10* for Cell Spacing, *500* pixels for Specify Width, and click *OK*. You need to modify the properties of the table to make the background color the same as the other table on the page. To make this change go *Table*, *Table Properties*, and enter the custom color *255,255,204* for Background Color. See the table in Figure 7.7.

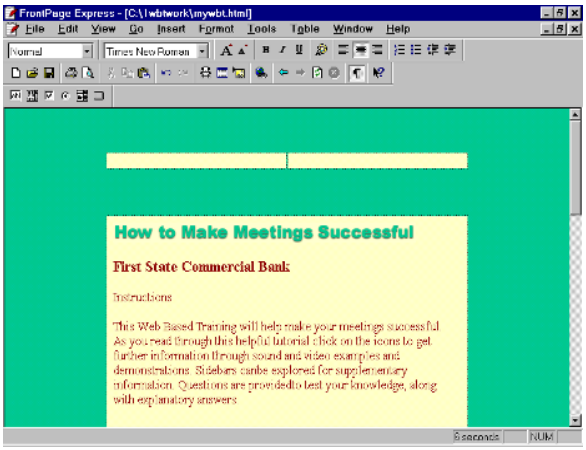
FrontPage Express - [C:\Iwbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars canbe explored for supplementary information. Questions are providedto test your knowledge, along with explanatory answers.

Figure 7.7 A 1-row, 2-column table 500 pixels wide table.

Place the cursor in the left cell and click the image icon. The Image window will open. Enter *media/fscb.jpg* in the From File box and click *OK*. The table now has the FSCB logo in the left cell and is ready for the navigation menu in the right cell. See the table in Figure 7.8.

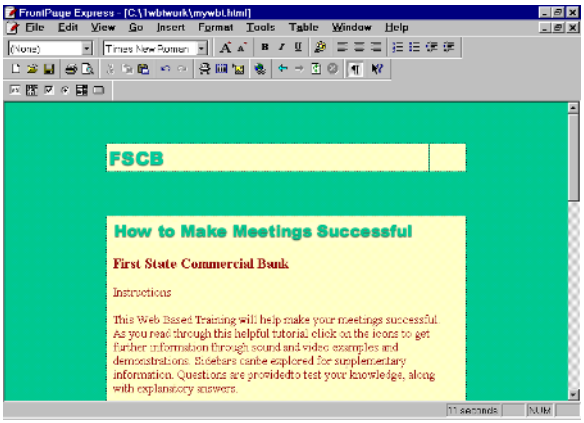
FrontPage Express - [C:\Iwbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
FSCB
How to Make Meetings Successful
First State Commercial Bank
Instructions
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Figure 7.8 A 1-row, 2-column table with logo at left.

Place the cursor in the right cell, then go *Table*, *Insert Table*, and enter *1* for Rows, *4* for columns, *Right* for Alignment, *0* pixels for Border Size, *3* for Cell Padding, *3* for Cell Spacing, *170* pixels for Specify Width, and click *OK*. The table for the navigation menu now appears as shown in Figure 7.9.

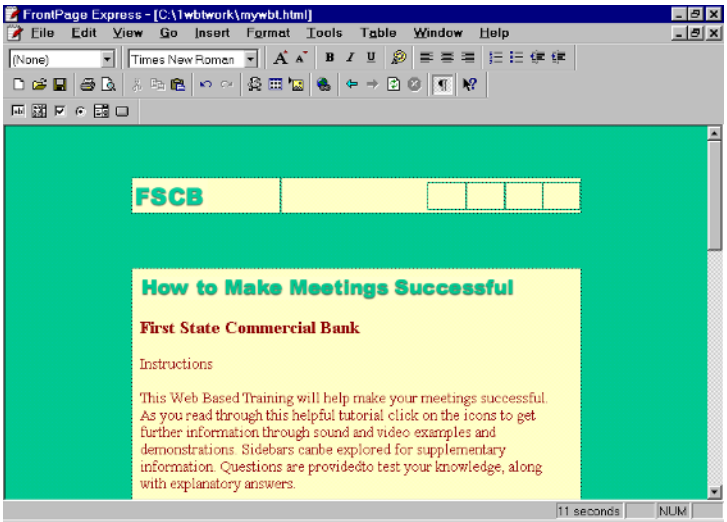
FrontPage Express - [C:\1wbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
FSCB
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars canbe explored for supplementary information. Questions are providedto test your knowledge, along with explanatory answers.
11 seconds
NUM

Figure 7.9 A 1-row, 2-column table with a table inside right cell.

Changing the background color of each cell will improve functionality. Make the cell that indicates the current selection red and the other cells green. Click in the left cell and go *Table*, *Cell Properties* and set the Background color to red. Click *OK*. Repeat the process to change the background of the remaining cells to medium green. Remember, you will need to define a custom color using the RGB numbers *0,204,102* (see Figure 7.10).

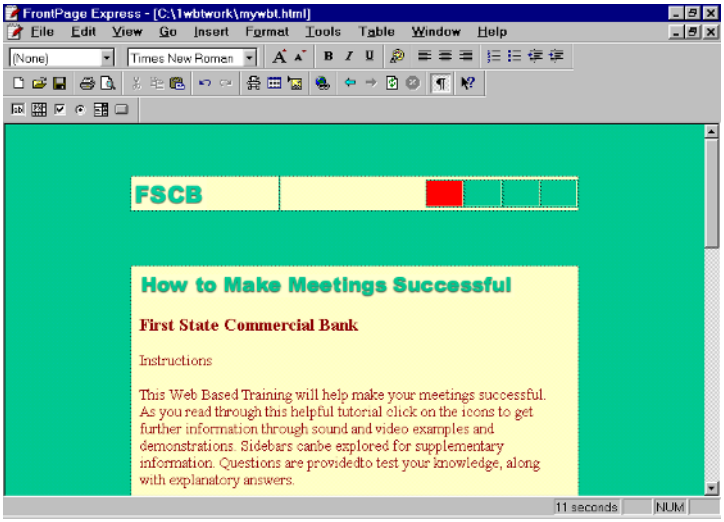
FrontPage Express - [C:\Twbtwork\mywbt.html]
File Edit View Go Insert Format Tools Table Window Help
(None)
Times New Roman
FSCB
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars canbe explored for supplementary information. Questions are providedto test your knowledge, along with explanatory answers.
11 seconds
NUM

Figure 7.10 Table with cell background colors changed

To finish the navigation menu, text will need to be placed in each cell and linked to appropriate Web pages. Type *Introduction* in the red cell. Type *1*, in the next cell, *2* in the next, and *3* in the last. Create links from 1, 2, and 3 to *chapter1.html*, *chapter2.html*, and *chapter3.html*, respectively. Highlight the text and click the Align Center icon and the Bold icon to make the text stand out more. Now you have an attractive navigation menu that can be reused on any page in the Meetings tutorial. Save and preview in the browser (see Figure 7.11).

First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Address C:\1webwork\mywbt.html
Go
FSCB
Introduction 1 2 3
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful. As you read through this helpful tutorial click on the icons to get further information through sound and video examples and demonstrations. Sidebars canbe explored for supplementary information. Questions are providedto test your knowledge, along with explanatory answers.

Figure 7.11 Complete navigation menu.

To reuse this navigation menu on another Web page, simply change the background color in the table for the currently open page and eliminate the hyperlink. (A link that links the page to itself is inappropriate. The red background indicates the current Web page and does not have a link.) In this example for Chapter 1 of the tutorial, you can see that the second cell with *1* is now red, and *1* is not linked to another Web page. The first cell now has *Introduction* linked to *index.html*, and the cell background color has been changed from red to green (see Figure 7.12).

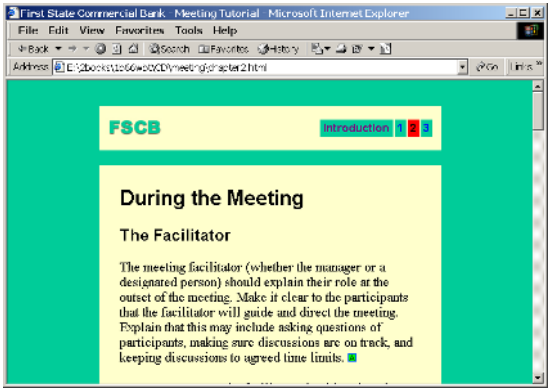
First State Commercial Bank Meeting Tutorial Microsoft Internet Explorer
File Edit View Favorites Tools Help
FSCB
Introduction 1 2 3
During the Meeting
The Facilitator
The meeting facilitator (whether the manager or a designated person) should explain their role at the outset of the meeting. Make it clear to the participants that the facilitator will guide and direct the meeting. Explain that this may include asking questions of participants, making sure discussions are on track, and keeping discussions to agreed time limits.

Figure 7.12 Navigation menu for *chapter1.html*.

Variations with Tables

You can use tables with various configurations for navigation menus. Your WBT presentations may benefit from a multi-row, single-column navigation menu (see Figure 7.13).

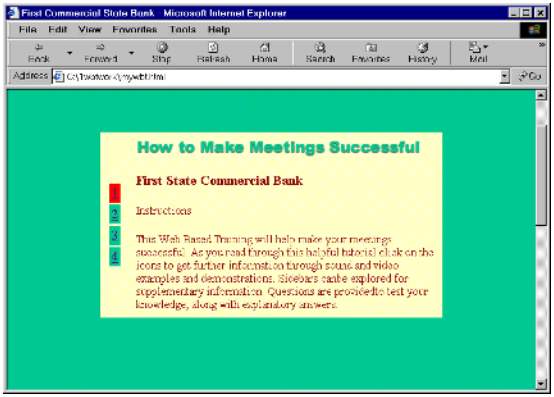

Figure 7.13 Multi-row, single-column navigation menu.

A navigation menu configured like this is narrow and fits well on the left or right of text in your WBT presentations. Use the same color scheme described earlier to designate the page currently loaded in the browser.

For larger, more extensive navigation menus you may need to create multi-row, multi-column tables. These are generally too large to integrate into the text of a Web page, and they work better at the top or bottom of the page (see Figure 7.14).

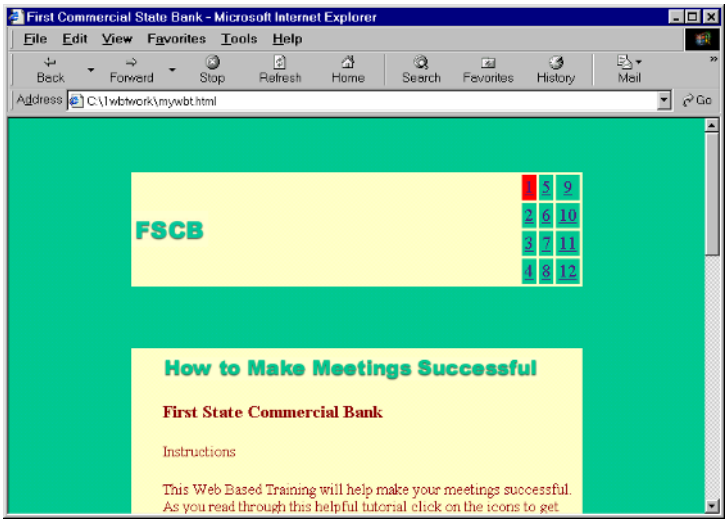
First Commercial State Bank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Address C:\1wbtwork\mywbt.html
Go
FSCB
1 5 9
2 6 10
3 7 11
4 8 12
How to Make Meetings Successful
First State Commercial Bank
Instructions
This Web Based Training will help make your meetings successful.
As you read through this helpful tutorial click on the icons to get

Figure 7.14 Multi-row, multi-column navigation menu.

Imagemaps

An imagemap is simply one image that has multiple links added for navigation. As the developer, you add links (hotspots) to appropriate areas of the image. Users then click on a hotspot (link) to go to another Web page.

When a student moves the cursor over a hotspot in an imagemap, the cursor will change from an arrow into a hand. This is the indication that the image has links and serves as more than just a picture.

Be careful when you employ imagemaps in WBT presentations. The image used should clearly indicate it is more than a picture or design element (see Figure 7.15).

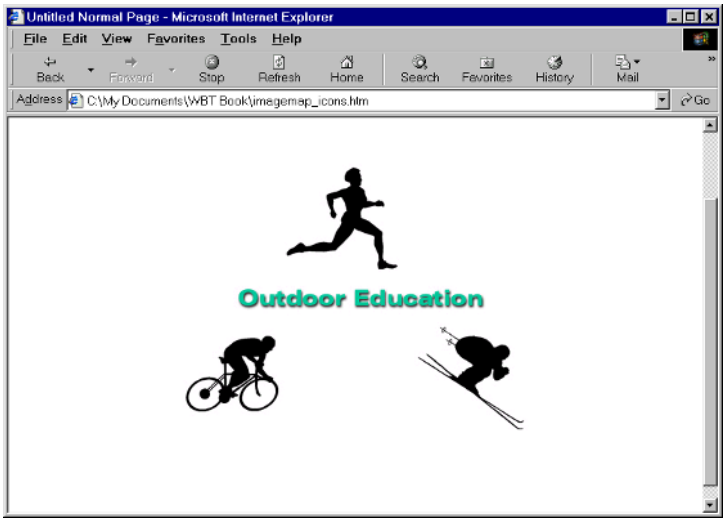
Untitled Normal Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail
Address C:\My Documents\WBT Book\imagemap_icons.htm
Go
Outdoor Education

Figure 7.15 Imagemap and text.

A combination of text and illustrative images is commonly used in WBT presentations, so imagemaps should stand out as something different.

A major difference between FrontPage Express and Composer is that FrontPage Express cannot create imagemaps but Composer can. This section will show you how to create imagemaps in Composer and also in a freeware imagemap editor named Web Hotspots from 1automata (*http://www.1automata.com*). There are

numerous imagemap editors available, and most use very similar processes. If you have a different image editor, you can follow along with the exercise to pick up the basics.

You can also create imagemaps with advanced Web authoring software such as Microsoft FrontPage and Symantec Visual Page. This makes the creation of imagemaps fast and easy.

Composer

Open Composer. Click the image icon and the Image Properties window will open. Enter *media/imagemap.gif* for Image URL. To begin editing the imagemap, click *Edit* under Image Map. The Image Map Editor window will open with the image loaded for editing (see Figure 7.16).

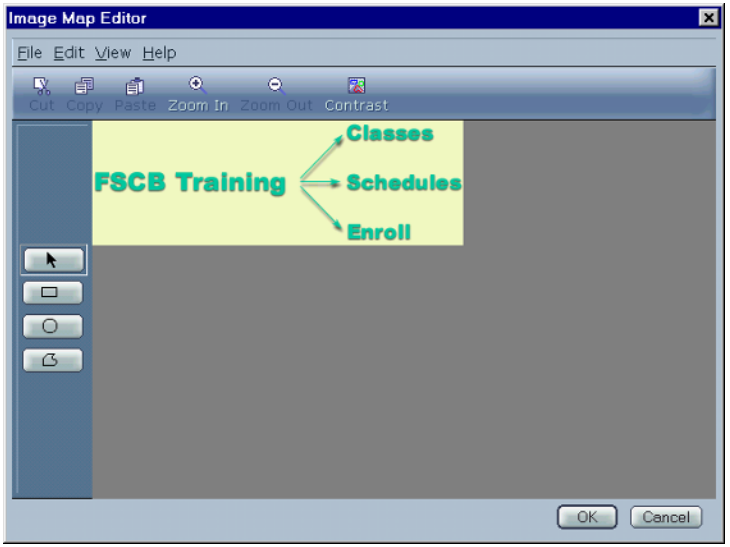

Figure 7.16 Image Map Editor window.

Click the Rectangle icon in the toolbar on the left. Place the cursor above and to the left of the word *Classes.* Click and drag to the

lower right creating a box around the word. This box represents a hotspot that can be clicked like any other link. When you let the mouse button up the Hotspot Properties window will open (see Figure 7.17).

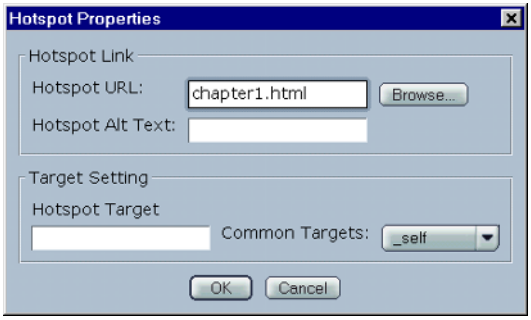

Figure 7.17 Hotspot Properties window.

Enter the URL for the Web page to which you want to link. To carry through the example, enter *chapter1.html* for Hotspot URL. Click *OK* until you return to the main Composer window. The image will not show any visible sign of having been converted into an imagemap. To view the results, save and test the Web page in a browser.

Use the Circle icon to define oval or circular hotspots in your imagemaps.

When the need arises, you can define hotspots of any shape using the polygon tool. This tool can be useful when hotspots are created in complex images such as digital photographs.

Web Hotspots

Web Hotspots enables you to create an imagemap in two different ways. The first way, you open an image in Web Hotspots, create hotspots for links, then save your work as a Web page (that includes the image). The second way, you open the existing Web page that includes the image, create hotspots for links, then save the Web page. This chapter covers the second way, but the first way works well too.

Open Web Hotspots. Go *File*, *Open*, and *Browse* to the file *imagemap_exercise.html*, then click *Open*. The Choose HTML Entry window will open, and the image file for the imagemap will be highlighted (see Figure 7.18).

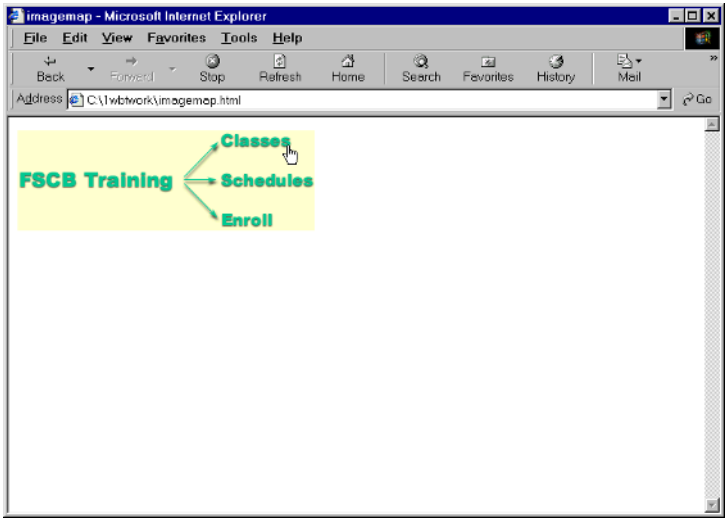

Figure 7.18 Choose HTML Entry window.

Click *OK* and the Open Image File window will open (see Figure 7.19).

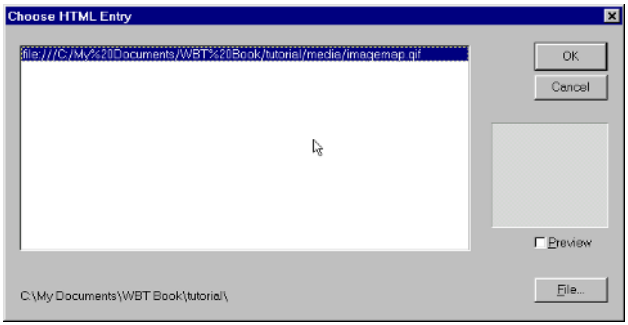

Figure 7.19 Open Image file window.

Click *Open* and a new window will open to enable you to insert and edit hotspots (see Figure 7.20).

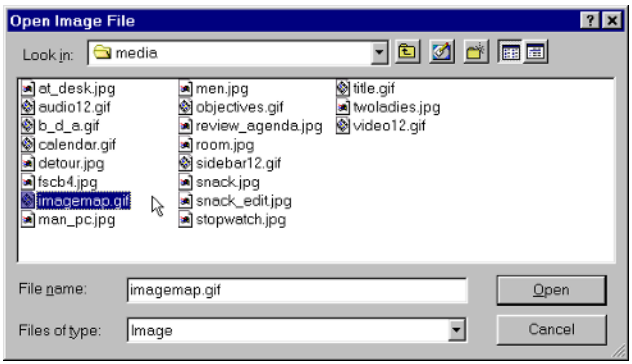

Figure 7.20 New Web Hotspots Edit window.

Click the Enable Rectangle Marking Mode icon in the upper left of the toolbar.

Move the cursor to a point just above and to the left of the word *Classes*. Click and drag to the lower right to create a rectangular

hotspot over the word. Release the mouse button when the dotted rectangle completely covers the word. Web Hotspots depicts hotspots with this dotted box for editing purposes. You can use the circle, oval, freeform, or polygon marking tools to create hotspots in any shape necessary.

After using the selection tool, an entry appears in the URL list to the right of the image (see Figure 7.21).

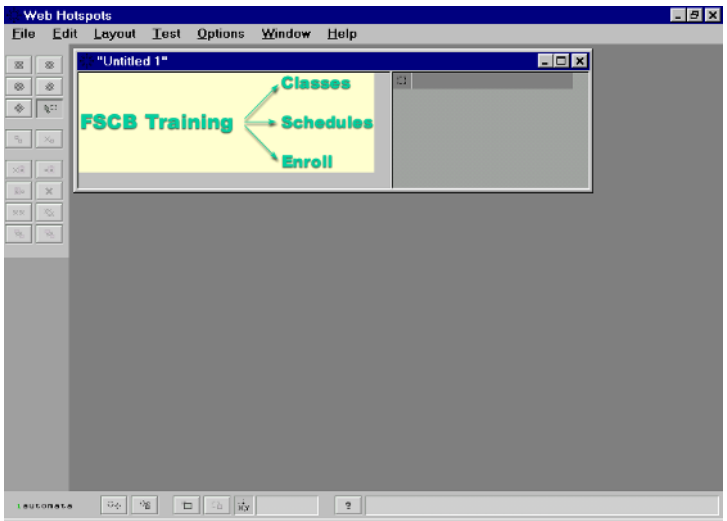

Figure 7.21 URL edit list.

Click once on the top entry to make it active. Enter *chapter1.html* for the URL. You can use the Enable Selection Mode to resize or move a hotspot. To use this function click on the Enable Selection Mode icon.

If you decide to remove a hotspot, simply click on the Enable Selection Mode icon, then go Edit, Delete.

To save your new imagemap Go *File*, *Save,* and the Save Imagemap Into window will open (see Figure 7.22).

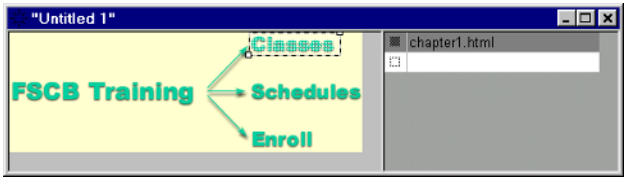

Figure 7.22 Save Imagemap Into window.

Accept the default location and click *Save*. The Choose HTML Entry window will open with the image file highlighted. Click *OK* and the Implementation Options window will open (see Figure 7.23).

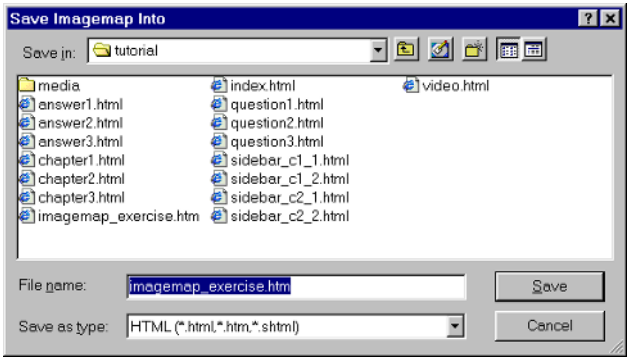

Figure 7.23 Implementation options window.

Enter *mymap* for Map name, and click *OK*. You have created an imagemap in the Web page *imagemap_exercise.html* that links the Classes portion of the image to a new Web page. To view the results, save and test the Web page in your browser.

Summary

Navigation can be simplified for students yet be attractive on a Web page. Use tables to set up navigation bars and menus. Be creative. There are plenty of possibilities with configuration, cell size, background color, and text color. You will not find making navigation devices using tables any more difficult than other Web authoring tasks.

When you need something special, have a digital artist make a navigation graphic for you. You can turn it into an imagemap, this is, embed links in it. An imagemap is essentially a navigation bar or menu disguised as art or Web page trim. You can take any graphic you like and easily turn it into an imagemap with a imagemap utility program.

Elsewhere in this book it states that even just a color logo on a Web page makes the Web page more attractive and gives it more authority than a plain Web page. You can integrate a logo into an imagemap and kill two birds with one stone: logo and navigation menu.

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III

Publishing Web Pages

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8

Web Hosting

You develop WBT presentations and store them locally (i.e., on your hard disk). Thus, you can test quickly and easily during the initial development. There comes a time, though, when you need to transfer the files to a Web host (server computer) on your organization's intranet or on the Internet. You can do this when the WBT presentation is complete or perhaps even earlier to get selected students involved in the testing. The process of transfer-

ring your WBT presentation files to a Web host is commonly called publishing or posting, although from a digital point of view, it's often called uploading.

Early in the process of developing WBT, you need to explore your options for hosting your WBT presentations. One option is to host internally on your organization's intranet website. Another is to host externally on the Internet with an Internet Service Provider (ISP) host.

Intranet Host

If your organization already has an internal website, most of the work related to implementing WBT may already be done. Guidelines for Web hosting and hosting software as well as maintenance procedures are probably in place. Check on your organization's website or contact your network administrator to find out more.

In large organizations, the complications of managing an internal website (or multiple internal websites) can be significant. There may be dozens of people developing Web pages for everything from management communications to carpool schedules.

A systematic approach to organizing and deploying a large body of content is an organizational necessity. Usually, a person (or persons) manages the content. This position is often designated *webmaster*. This approach works best for small to medium website management situations. A more elaborate approach is to use enterprise software to assist the webmaster in managing the website. Some refer to this type of a program as a content management software.

Webmaster

If your organization has an internal website, it probably has a webmaster, although in some organizations the network administrator manages the internal website, and there is no specialist webmaster.

The webmaster usually determines what WBT developers can and cannot use. Not all Web authoring software generates code that meets recognized standards, so the webmaster may permit only the use of specific software. For instance, your Web authoring software needs to communicate the input from forms to the Web server correctly every time. This may mean that the webmaster authorizes only a specific program for Web development.

The webmaster, sometimes in conjunction with other computer personnel, may set Web page design standards. Web design standards often include guidelines on appropriate content, use of images and color choices, and standards for navigation. Make sure you understand the rules of the road for your intranet before you start developing. Otherwise, you may waste time and effort.

Webmasters create departmental folders and manage other aspects of the internal website operation. Without an overall plan the website could turn into complete chaos. Thus, you need to work closely with your webmaster (or network administrator) to ensure that you can do what you want to do and can find out how to do it.

Content Management Application

Large organizations with elaborate internal websites or multiple Web servers need more than just human intervention to manage content. Content management programs help perform many tasks

once relegated to employees. The larger the website, the more the content management program helps productivity.

If your organization uses such a program, you need to learn to use the interface for it. The interface helps you do things such as upload Web files to the server (host) computer more easily than the usual way. But it may also regulate your actions. For instance, it may refer your files to someone for approval before he or she posts them to the internal website.

Internet Host

You may develop your WBT presentations for a wide audience that includes students outside the walls of your organization. Although you could host your WBT presentations on an internal Web server, allowing outsiders to access such a server might pose a security risk. Many organizations don't allow outsiders to access their internal networks.

You have two alternatives. Your organization may operate a Web server especially set up to handle outsiders; that is, it may operate a website accessible on the Internet but not on its intranet. You can upload your WBT presentation Web pages to that server and make them available via the Internet.

The other alternative is to use an ISP host. The ISP operates the Web server. All you have to do is upload (via the Internet) your WBT presentation Web pages to that server, and you're on the Internet. This is an attractive alternative for small organizations and individuals.

ISPs are in business to provide dial-up accounts for customers to access the Web and to use email. They may also provide Web hosting as part of their service. Some ISPs specialize in Web hosting and don't even offer dial-up services.

Where to Go

Geography does not have to dictate your choice of a Web host. Your Web host may be halfway across the country, and it won't matter. You can directly upload your files to the Web host computer via the Internet.

In Florida

One of the authors uses a host ISP in Florida for several websites even though he operates his business in California. He also has a local ISP in California for dial-up access.

Hosting packages can offer a range of services and features. Examine them closely to select a package that meets your needs.

Minimum Requirements

Review the features listed below when shopping for a Web host.

Web Server The Web server software may be important in choosing a host. If your organization runs Microsoft NT, you may want a Web host that runs Microsoft NT. If your organization runs UNIX, you may want to find a host that runs UNIX. Using a familiar operating system may mean better internal support. In addition, you may have special software you need to operate with the Web server, and you need a compatible operating system to run the software.

Wide Bandwidth Your Web host ISP should have a wide bandwidth connection to the Internet. Many have multiple connections to accommodate traffic. Some ISPs sometimes overload their available bandwidth by connecting too many customers for existing capabilities.

Traffic Allowance Look at the allowance for data download.

The ISP measures how much data is downloaded by students from your website. Allowances vary greatly, so check carefully. Overages are usually charged a modest fee, but some ISPs charge a fortune for them.

Adequate Disk Space This is the space you use on the host ISP's hard disk to store all the files that make up your WBT presentation. Make sure you have enough. Check on overage fees for hard disk space.

CGI Access Common Gateway Interface (CGI) scripts are embedded programming that can add functions and interactivity to Web pages (see Chapter 13). This can be a real benefit for WBT presentations, so look for a hosting package that includes access to CGI. Even if you don't use this capability right away, you'll undoubtedly need it in the future.

FTP Access This is a basic feature of any host account and should not be treated as an add-on. File Transfer Protocol (FTP) is the means by which you upload Web pages and manage files and folders on a remote website.

Technical Support This is an important consideration. Some ISPs provide support through technical documentation in Web pages and also through email and telephone. You need convenient support. You probably won't use it much, but when you need it, it should be convenient.

Low Cost Web hosting is a very competitive business. Do your research. You can save money if you shop.

Downtime Downtime will make your WBT presentations unavailable. Ask about downtime history. Downtime more than a few hours a year is substandard.

Media Server Advanced WBT presentations often use streaming sound or video. Plan your future needs and select an ISP that offers a streaming media server such as RealServer.

Avoid the shortcut of serving your streaming media from a Web server. Streaming via a Web server does not work as well for anything but the lightest traffic.

Pricing

The price you pay to host your WBT presentation will depend on how big it is, how often users access it, and how many users access it. Make your estimates for these factors as accurately as possible and use them to price Web hosting packages. Prices range from as little as $10 per month to over $1,000 per month.

Pick a Name

If you are hosting your WBT presentation at a host ISP, you need to consider the domain name that you will use. You have two options. First, you can use the Web host's name with yours appended. It would look like: *www.hostisp.com/mywbt/.* Perhaps more desirable is to register an original domain name such as *www.mywbt.com*. Your ISP can assist you with registration.

Uploading Your Web Pages

If you are hosting your WBT presentation at a host ISP, you upload your files using FTP. (You may need to use FTP within your organization if this is the uploading process established by the webmaster.) This is easy to do with an FTP program. This chapter illustrates WS_FTP Pro. This is a well-known FTP program that Web developers have used for years and is available at a multitude of shareware websites.

Using WS_FTP Pro

To begin the uploading process you will first need to connect to the Internet. After you connect, open WS_FTP Pro. You will see two windows (see Figure 8.1).

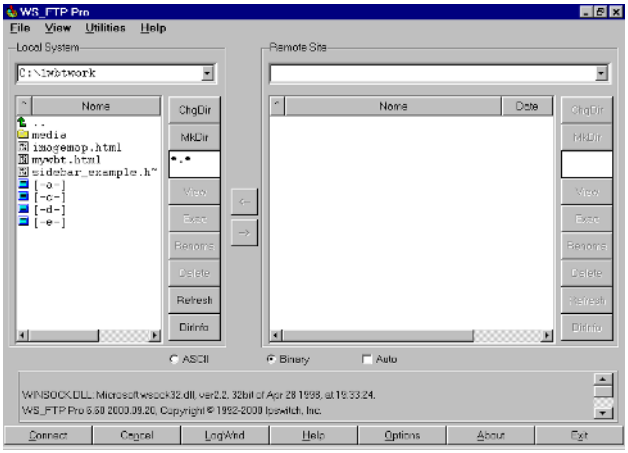


Figure 8.1 WS_FTP Pro.

The left window is a folder tree for your computer. The right window is a folder tree for the remote site (the host ISP). Initially, you will not see anything in the right window. You need to connect to the host ISP in order to see these files and folders.

Connecting

First you have to connect to the FTP site. Click on the *Connect* button. The Connection window opens. With the Host info tab selected, click on the *My Sites* folder to select it (see Figure 8.2).

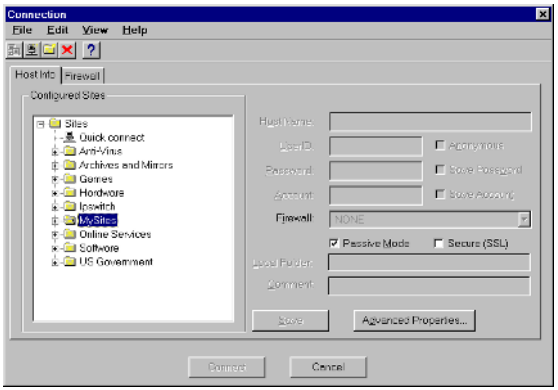


Figure 8.2 My Sites folder.

Go *File, New Site*. The New Site window will open. Create a site named *My Web Training*. Then enter the domain name address of your new domain (*e.g., www.mywbt.com*) or the address provided by the host ISP (e.g., *www.hostisp.com/mywbt/*), then click *Finish*. Enter your User ID and password provided by the host ISP. Check the box that saves your password so that you don't have to enter it again. Click *Connect*, and you'll connect to your website (see Figure 8.3).

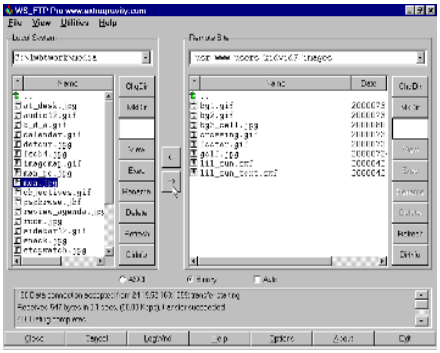
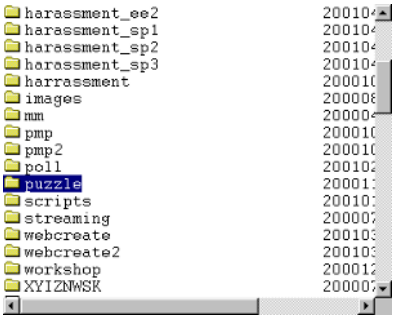


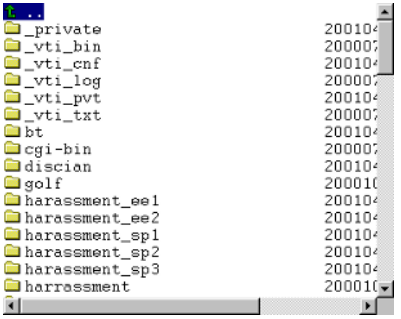
Figure 8.3 Connected FTP client.

Look for the root folder for Web files for your site. Popular names for the root folders of websites are *public_html*, *virtual_html*, or *www*. If it isn't clear which is the root folder, ask your host ISP or read the ISP's instructions, probably posted somewhere on its website.

To switch to another folder down the tree, double-click on a folder name.



To switch to another folder up the tree, double-click on ../ at the top of the list of folders and files.



You do the same to navigate the tree for your own computer in the left window. Find the Web files on your local hard disk this way (see Figure 8.4). Most of the time you will transfer files from left to

right, from your local hard disk to your folders on the host ISP's hard disk.

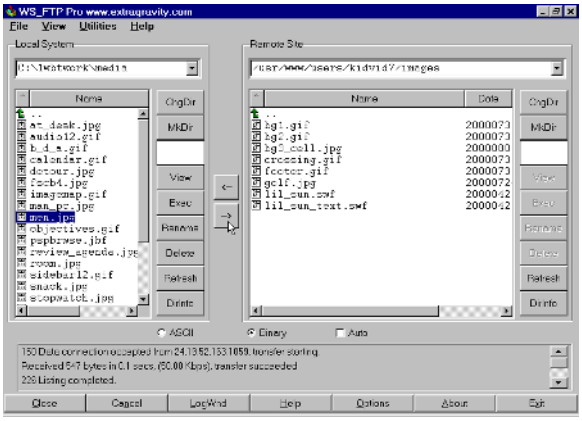


Figure 8.4 WS_FTP Pro ready for action.

Uploading

You can use an FTP program to create folders and organize your content. (You can also upload entire folders along with their content to preserve the folder tree structure you created on your local hard drive.) To create a folder on the host ISP's hard disk, click on the *MkDir* button.

Enter the name of the new folder in the Input window, and click *OK* (see Figure 8.5).

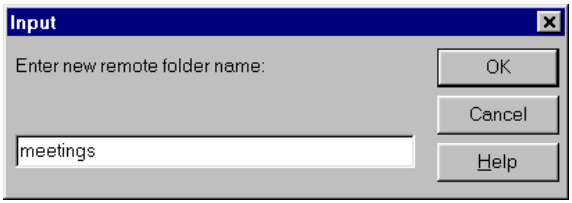


Figure 8.5 Input window.

To transfer a file from your local hard disk to your folder on the host ISP's hard disk, select the Auto check option. Highlight the file in the tree in the left window and click the arrow button pointing to the right. The file will upload and will appear in the folder tree list on the right.

Other Functions

To delete a file or folder, highlight it, and click on the *Delete* button.

WS_FTP Pro will delete it. If a folder has files in it, you will be unable to delete it until you first remove or delete all the files from it. To rename a file or folder, highlight it and click on the *Rename* button.

Type the new name into the Input window and click *OK*.

Authoring Program Uploads

Composer and FrontPage Express are capable of uploading files to your website. This can be a handy feature if only minor editing to a WBT presentation Web page is necessary. If you are uploading multiple Web pages, it's more efficient to use an FTP program like WS_FTP Pro.

Composer

Make sure you are connected to the Internet. In Composer, you can open a file from your website, edit it, and then save. While this isn't really uploading, it can enable you to make quick edits.

Go *File*, *Open Web Location*, and enter the URL for the file you wish to edit in your WBT presentation (*e.g., www.mywbt.com/chapter1.html*). Click *Open* and the file will open in Composer (see Figure 8.6).

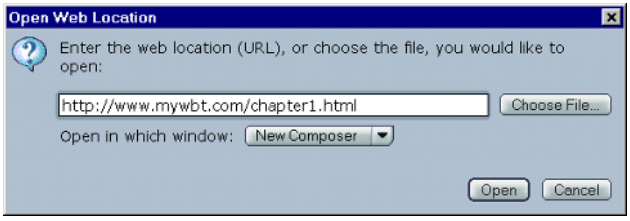


Figure 8.6 Save As window.

Edit the file and save.

FrontPage Express

To upload with FrontPage Express, go *File*, *Save As*, and the Save As window will pop up (see Figure 8.7).

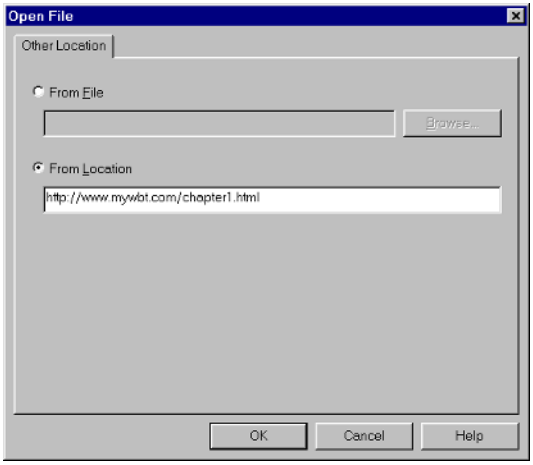


Figure 8.7 Save As window.

Enter the title and the URL (*e.g., www.mywbt.com/chapter1.html)* and click *OK*. This starts a series of windows that logs you into your FTP service for your website.

Summary

Publishing Web pages or your WBT presentation is as simple as knowing where and how to upload the Web page files. For your intranet, consult your network administrator or webmaster to determine where to upload. For an ISP Web host, consult the ISP to determine where to upload. Use the FTP uploading feature of an authoring program to do the upload, or to keep it simple and use only one program, use an FTP uploading/downloading program such as WS_FTP Pro.

This process requires a lot of details (e.g., correct FTP addresses, logins, and folders) but is otherwise straightforward.

IV

WBT Basics

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9

Defining WBT

What is WBT? The Web is a multimedia medium. If you put a book (text only) on the extreme left of the scale and a full-fledged multimedia WBT program (complete with automatically graded exams and automatic reporting on student performance for instructors) on the extreme right of the scale, you will get an idea of the full gamut of WBT, which can include media appealing to auditory, visual, or kinesthetic learners. Most of the WBT prod-

ucts you will create will fall somewhere in between. The remainder of this chapter goes from left to right on that spectrum.

Text

The Web enables competent treatment of text. Indeed, HTML enables not only structure for text but also style (automatically provided by a browser). In other words, HTML provides a usable typesetting (typography) system.

In a multimedia system, text seems to take a back seat to other more glamorous media. You hear people say things like, "Text is dead." That's understandable with the new freedom to use diverse media very cost-effectively, but it's not true. Text remains the core medium for the Web and certainly a primary one for education. For example, you can read the dialogue in a video production in much less time than it takes to listen to or watch the video. Text is quick, efficient, and cost-effective. It usually takes a team of experts to make an audio production or video production. But one writer can write a work by himself or herself, and individual people are usually less expensive than teams (sadly, writers are a dime a dozen).

The conclusion to draw is that text is a very valuable asset for education via the Web. Chapter 15 provides you with the technology to maximize readability today. That chapter also indicates why the text medium will get better in the future on the Web.

So What?

When all is said and done, if all you have on the Web is text, so what? In other words, what if all you have is a book online?

First, it needs to be said that books are a valuable part of training. By putting a book (or printed training materials) online, you can save money over publishing in print and can also upgrade more quickly, more often, and less expensively. In fact, if the truth be known, a large share of WBT now available is strictly text online, nothing more.

Second, text online is different from text in print. By being online, it can be made available via a variety of digital devices: it is available over a wide geographical area; it is shareable at long distances; and it can work together with other means of digital communication (e.g., email).

Don't underestimate text as a vehicle for WBT. It is the central media for WBT.

The New Text

One can imagine a printed 2,000-page maintenance manual converted to the Web. The text will not be any less tedious on the Web than it is off. In fact, the endless scroll of long Web pages is, if anything, more tedious than the same text in print. So, the conclusion you should draw is that text is not very workable for WBT, right? On the contrary, you will find text to be a very workable medium, but you will have to treat it differently than you do in print.

How do you treat text differently? It's a combination of writing and typesetting treatments. For instance, putting text into a readable column is essential on the Web just as it is in a magazine or book. Writing in short and medium-size paragraphs and using lots of headings help relieve the tedium of endless scrolling. Consequently, treating text a little differently goes hand in hand with making text work for WBT.

Images

Images are the spice of the Web. Some readers will remember that the original Web browsers were text-only (e.g., Lynx). This was an attractive online technology, but it didn't set the world on fire. However, in 1993 Mark Andressen and his colleague students at the University of Illinois invented a multimedia Web browser, Mosaic. Subsequently, Mr. Andressen and his colleagues founded Netscape and invented the Netscape browser. This browser did set the world on fire. The combination of color images and text online proved to be a revolutionary medium.

Authors use images (e.g., color photographs, digital art) on the Web as essential expressive elements in the creative process. Web developers use images (e.g., Web page and website treatments) to make attractive presentations. Businesses use images (e.g., logos, color advertisements) on the Web to sell things. Families keep images (e.g., photographs) as they have for over 100 years but share them more conveniently on the Web.

Images on the Web bring to the Web the attractive color of a fine magazine. Without color images, the Web would still be a curiosity of the technological elite and would not be the powerful mass medium it is today.

Something More

If you are to make your WBT something more than just a book on the Web, using images is one way to do it.

Page Treatment

A powerful enhancement is to use color trimmings for page decoration. Pages with such trimmings are simply more attractive and

readable. However, don't overdo it. Subtlety is always more appropriate than a heavy embellishment that may detract from text. Nicely trimmed pages have more authority and are more convincing than plain pages. For instance, a page with nothing more than a small corporate logo in color has much more authority than a plain page.

Graphic Information

Of course, the color images that really whet your appetite are the ones that provide information. A photograph is worth a thousand words just as much on the Web as off. The nice thing about the Web is that space is unlimited.

Color printing on paper is expensive, and the expense is always a limiting factor. Publishing on the Web in color is inexpensive; the capability to include a generous amount of color in an article or book on the Web presents a significant educational capability simply not available in the print medium at a reasonable price. Consequently, the use of color graphic information presents a wonderful opportunity for those authoring WBT.

Enhanced Book

When you add images to your Web pages, what do you have? Just an image-enhanced book? This enhanced book starts to look like a presentation that has more potential for education than a normal book. For instance, suppose the text presentation is on a topic in archeology. In a printed book you might be able to include a dozen or two color photographs. In a Web book, you can add an unlimited number of photographs *at little additional expense*. The photographs have a great pedagogical value. Just the capability to include them and have all students conveniently access them makes a simple Web book (with images) look like clever WBT.

From Whence?

From whence do these photographs come, and why are they inexpensive? An archeology professor might take 2,000 photographs for a one-season project at an archeology site. If he or she were to write a book about the project, typically 600 of the 2,000 photographs might be appropriate to be used. If included in a printed book, typically only 30 would be used. In a Web presentation, however, potentially all 600 could be used. As a practical matter, less than 600 would be used, but the extra photographs, over and above the 30 for a printed book, can be used at little additional expense for the photographs. Yes, there will be some additional effort and expense for digitization, placement in Web pages, and storage on a hard disk, but the extra expense will be nominal. Thus, the professor can create a greatly enhanced educational product inexpensively.

On the other hand, if you have to buy stock photographs at $250 each or send a photographer to Costa Rica for a week to take photographs, the photography could prove an expensive addition to your Web presentation.

Animation

Animation has been well used in training and education for a long time, and there's no reason you can't use it on the Web. Chapter 12 briefly covers how you might use animation for WBT. Still, this book does not cover animation in detail, not because it isn't potentially valuable to training but because it's a graphic designer's specialty. Others are unlikely to create it easily.

Interactivity

Built into the Web is the capability for interactivity. Five ideas for using Web interactivity to create a WBT product follow:

1. A link to other information such as another place in a Web page, another Web page, another website, an image, or another medium (e.g., streaming audio).
2. A link to a function such as a mail link that pops up an email client ready for a student to use or a link that pops up a menu.
3. An input in a form, which enables a student to provide data.
4. A link and input for a simple program—such as a custom calculator—embedded in a Web page.
5. A response to a complex program embedded in a Web page. Since programming in a Web page can do anything programming elsewhere can do, there is no limit on the interactivity that can be placed in a Web page (other than the limit of digital technology). For instance, you may want to provide a word processor or a spreadsheet.

The interactivity provides a choice to a student or requires input or action from him or her. Thus, a student interacts with the Web presentation, presumably enhancing the learning process. This interactivity might provide convenience to a student, lead a student to self-customize the presentation, or even test a student. It certainly adds a dimension well beyond a printed book. In fact, a so-called ebook can include such interactivity; that is, an ebook can have links, a capability not found in printed text.

Consequently, it makes sense to say a Web book enhanced with interactivity, or an ebook, has much potential for being a useful WBT product.

Sound

Music certainly has a place in entertainment (e.g., movies) and therefore in education too. But music is well beyond the scope of this book. Consequently, our discussion of sound will be limited to voice, a traditional pillar of training and education, and essential for auditory learners.

Voice, the instructor's voice, is the prime medium of the classroom. Certainly, you can use it also in WBT, either a little or a lot.

Because sound files are so large, it doesn't make sense to download them and then play them; it takes too long. Rather, a sound device that starts to play the sound immediately as the sound file downloads is more desirable. Since it doesn't wait until the downloading is complete, it is said to *stream*. It is streaming sound that you need to use for your WBT.

A WBT presentation might include sound to enhance text or to provide a major portion of the content. It can start automatically or upon some action of the user (e.g., click on a button). A voice can make a rich contribution to WBT that text alone often cannot match. Additionally, the combination of sight and sound involves two senses, thereby increasing the likelihood of student retention. Unfortunately, considering its value, potential, and ease of production, sound is the most underused medium on the WBT. If you go to the trouble of including sound, you will make your WBT stand out. And sound will make a solid educational addition to your WBT projects.

Ease of Production

Go to an audio expert, and he or she will tell you that voice production is difficult and expensive. If they do it, they're right. If you do it, they're wrong.

Experts will tell you that voice must be scripted and recorded with professional equipment by audio technicians. They may even suggest a professional reader. Don't believe them.

An instructor presumably is an expert accustomed to speaking to students. An instructor may need an outline to speak (conduct a class) and ensure that all key learning points are covered, but he or she doesn't need a script and certainly doesn't need to read a script to the students. Clearly, recording an instructor to create content for use in WBT doesn't change this reality.

Equipment for high-quality voice recording is inexpensive today. Digitizing and processing voice for sound enhancement on a computer is not only inexpensive but can provide quality close to that of expensive audio equipment. For voice, the recording and editing processes may be practiced by amateur-professionals with minimal technical guidelines.

With the appropriate guidelines for using audio equipment, recording an instructor's presentation, and using audio software, you can carry on such production in-house. Even if you choose to subcontract it, you will not need to use scripts or hire a reader. See Chapter 17 for more information on recording and using voice.

Simulations

Doing simulations is more like a Hollywood production than teaching in a classroom and may require scripts and assistance from audio experts.

Synthetic Voice

Just write the text, and the computer (software) reads it to your students using computer speech. What a great way to use voice inexpensively and effortlessly. Unfortunately, it may not sound very

good. Certainly, long passages will prove tedious for students. But synthetic voice has its place, and you may find an acceptable use for it here and there. Experiment.

Video

Video is truly a fantastic medium. It rivets our attention to the screen. Like sound, you can use it to enhance text or to provide the primary content for WBT. Like sound, it streams. Also, like sound it can be reasonably inexpensive and easy to produce.

However, video comes with a huge caveat. We are all experts on high-quality video. Americans watch television over four hours per day on the average. Of course, high-quality video does not necessarily mean high-quality content. Nonetheless, high-quality video is expensive.

National network-quality video (e.g., CBS) is said to cost about $100,000 per hour, not including the cost of the content. Local network-quality video (e.g., KPIX, Channel 5, San Francisco) is thought to cost about $50,000 per hour, not including the cost of the content. How can you match this quality?

The answer is: You can't. And that's the biggest drawback of the medium. It's so expensive to use. So, the question becomes: What can you do with video? If you have a generous budget, you can subcontract to make an appealing WBT video presentation, Hollywood style. If your budget is limited, you can do the same thing you can do with sound, that is, record instructors using amateur-professional techniques.

Today's camcorders are high-quality and inexpensive. Easy-to-use recording techniques are quick to learn and work well. You can even edit video on a computer with inexpensive software, albeit somewhat painfully. (Professional video editing software and dedi-

cated hardware remain well above consumer pricing, but prices decline every year.)

Recording (e.g., with a camcorder) instructors teaching, guest speakers speaking, or corporate executives addressing the troops does not necessarily require Hollywood production talent. It's a mundane craft and within the grasp of most who aspire to create WBT. Even if you don't do the recording yourself, you can subcontract it for a reasonable cost. Thus, video is a viable medium for most of us to use for WBT, but one that has limitations.

There is no question that video can add value to WBT. The only question is the cost. Although currently there's also a question of the quality of streaming video in regard to PCs and network connections, as PCs operate above 1 GHz and as broadband network connections become generally available, the problems regarding video streaming quality will quietly evaporate.

Embedded Programs

The archetypal embedded program is a calculator. If you train people to calculate something, you can put a handy calculator right in the Web page as part of your WBT. Calculators are among the easiest and least expensive devices to program. In some cases, you may be able to create the programs yourself (e.g., using a Java authoring program such as Jamba, *http://www.jamba.com*).

Certainly, you can create a general calculator that will make a wide range of calculations. But those are readily available. You would probably be better off licensing one for use in your WBT presentations. It's the dedicated calculators, which give you an opportunity for distinction, that make sense to include in your WBT presentations. Students don't have to figure out how to use them. Students just plug in some appropriate numbers in well-

labeled inputs, and the calculator gives them an instant answer. Slick! This is cool WBT.

But embedded programs don't have to be calculators. They can be anything. The only drawback is that they are seldom off-the-shelf purchases when used for WBT. They are mostly custom programmed. Thus, they come with a potentially expensive price tag, and you have to find the right programmer to make them cost-effective.

Online Software

Unlike embedded programs, which are primarily custom programming projects, online software is off-the-shelf software that runs via the Web. It might be a word processor, an image editor, or something less general. It's software you would license to use in your WBT, and it's software you would want to provide to your students for a variety of reasons having to do with marketing, costs, standardization, etc. You will see more and more of these programs on the Web in the future. Providing the necessary software will become an important consideration for the WBT of tomorrow. Yet it's quite possible to provide such software today.

For instance, ThinkFree (*http://www.thinkfree.com*) offers free use of a Java word processor and spreadsheet. Both use Microsoft Office compatible files and both work over the Web. Even if your students don't need a word processor or spreadsheet, there may be another program that they do need. Find a Java version, and make it part of your WBT. Since such Web programming services are not exactly in the shareware tradition—even though they're comparable—you may not be able to find them at shareware websites, although that's where they belong.

Data

You can give your students the keys to unlock corporate data via the Web if they need it for their training. For many types of training, the data or information in the organization's database or archives is appropriate for student use. But let's use a broader definition of "data" for the sake of conversation. If data means any kind of data or information, this opens our eyes to many possibilities.

No longer do students have to do unnecessary time-consuming research. You can give them links directly to what they need whether on the intranet or the Internet. By the magic of links well organized on a Web page, you can make other resources, in effect, a part of your WBT. This is a powerful idea and one that works well.

It won't be long before everything is on the Internet. At that point, part of your job in the WBT business will be to act as a traffic controller sending your students here, there, and everywhere to find resources to supplement the specific educational materials you have provided for them.

Summary

Although simple text on the Web can be considered WBT, it's our opinion that WBT ought to be something more. If it's just text without even taking advantage of some of the inherent capabilities of the Web, it is little more than paper replication, hardly dramatic stuff for a multimedia medium. Even the weaving in of a little interactivity changes text from something traditional into something new. But more than interactivity is available for the weaving. You can add images, sound, video, embedded programs, online software, and data. These all make terrific building blocks for

WBT. In other words, you get to define WBT as it suits your students' needs. There is no other reasonable definition.

10

Interactivity and Usability

How do you construct a WBT presentation? After designing the training, you put together a series of Web pages. How you link them determines the structure and interactivity of the presentation. The links are the navigation, and easy navigation is determined by the structure. The ease of navigation determines usability. Thus, structure, links, interactivity, and usability are all interrelated.

The storage of Web page files and other media are not part of the structure of a WBT training presentation, and this chapter covers storage separately at the end.

Interactivity

Interactivity is one of the great capabilities of the Web and one of the reasons that the Web can be an effective teaching tool. Any time you give a student a choice, you draw him or her into the WBT presentation to make a decision. Providing a link creates a choice: to use the link or not to use it? Providing two mutually exclusive links (either or) provides even more of a choice. Such choices are called branching. A student goes in one direction or another. The thing to keep in mind is not to get carried away with branching. Complex (deep) branching can lead to confusion. Keep it simple (i.e., keep it shallow).

This section assumes that an interactive presentation attempts to teach a well-defined set of knowledge that each student is to learn thoroughly. It argues that a linear approach is the most effective for learning even in a Web environment. This implies the same path, or almost the same path, for each student. However, the end of this section recognizes that simulations are different. They simulate the real world, and each path each student takes through the Web of the simulation is likely to be different.

Linear

If you were to create a linear presentation of Web pages, it would be like a slide show (see Figure 10.1).

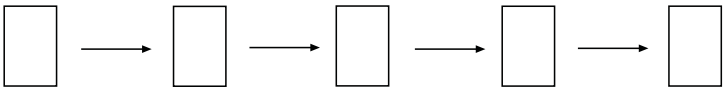


Figure 10.1 Linear presentation.

The Web gives you the power, though, to create nonlinear structures (see Figure 10.2). That is, you can create choices (branches) to go in one direction or another. Thus, a student making the choices is said to be not just a passive viewer but an active participant in the WBT presentation. Hence, the presentation is interactive.

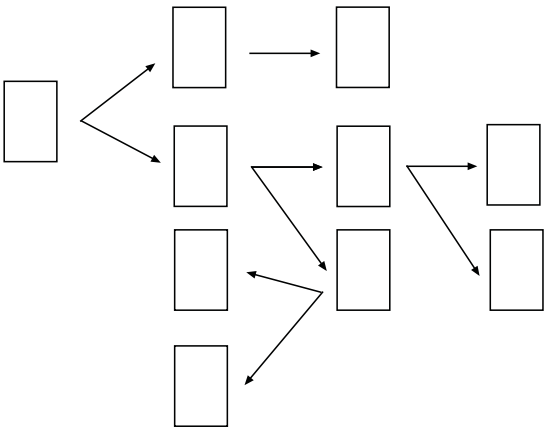


Figure 10.2 Nonlinear presentation.

Here are some things to keep in mind about interactivity:

1. Complex branching may make your WBT presentation too complex.
2. If you don't keep your branching shallow, students may get lost or frustrated.
3. A lost or frustrated student is not likely to learn easily.

4. Don't create branching just to be clever. Use it for a specific educational purpose.
5. Well-educated people compulsively want to learn the whole thing. This impulse is a conditioned response to learning everything in the textbook for years and years of school. Excessive interactivity may make it impossible for your well-educated students to digest the whole presentation (i.e., too many branches to follow to the end). Keep it simple (linear).

Interactivity that goes forward in a specific direction, a linear direction, seems to satisfy most students.

Branching

Branching to present information makes a Web presentation interactive via links. It's a great technique to use for WBT.

Deep

In a *perfect* WBT course on financial analysis, the course (by branching) would figure out that you missed the college algebra necessary to understanding the tutorial. The tutorial would then lead you through the process of learning the algebra and then return you to complete the course. Of course, this might take several weeks, but the WBT course would not let you progress without proving that you had the proper background knowledge.

As you can imagine, such a WBT course would be very complex (see Figure 10.3). As a practical matter, it would be easy to get bogged down in it, or even lost. It would probably become very confusing and frustrating. That's why complex (deep) branching is seldom workable, particularly without plenty of testing.

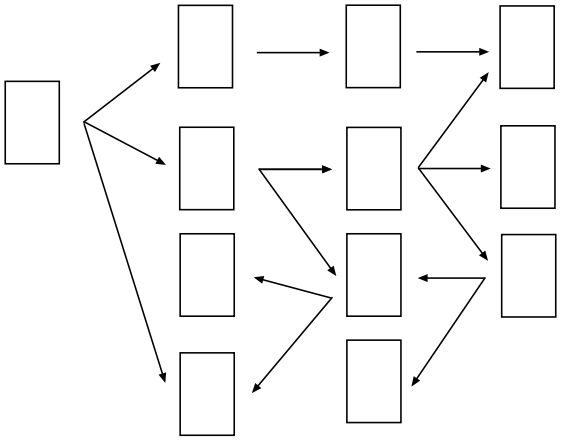


Figure 10.3 Complex branching.

People learn more quickly when new information is presented in a linear way. It's best to keep that in mind when creating branches (choices) in your WBT product.

Shallow

What is shallow branching? It's branching that gives you choices, takes you places, but always returns you to the mainstream presentation without straying too far away. For example, a sidebar is a branch when it is linked. A user can read it by clicking on the link or ignore it. It is a dead end branch; that is, a user goes to the sidebar, reads it, and returns to the mainstream course. Thus, the sidebar is a shallow branch.

A deeper branch might be one that asks the user to stop and make a choice between two information resources before continuing the mainstream course (see Figure 10.4).

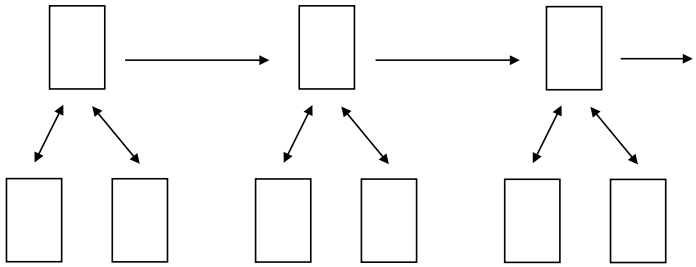


Figure 10.4 Shallow branching.

This is different from a sidebar in that it is essential information for the course, not elective information. For example, suppose your WBT course is on gun safety. You provide some introductory information. Then you tell the student:

To click on Link 1 if he or she has never used a handgun; and

To click on Link 2 otherwise.

1. Link 1 = Background information on handguns plus handgun safety rules. (A link back to the mainstream presentation is also included.)
2. Link 2 = Handgun safety rules only. (A link back to the mainstream presentation is also included.)

This is an effective and essential part of the course. Those who have never used a handgun are given sufficient background information to understand the safety rules. Those who have experience with handguns are not bored with introductory background information on handguns and are given only the safety rules. The organization of the course is easy to understand, because the branching is very shallow. Users are never more than one branch away from the mainstream.

If, however, you add an additional minimum number of branches (two), you now have four possibilities instead of two. Suppose that

for choice 2 you add another choice (set of branches). You tell the user:

To click on Link 1 if he or she has never used a handgun; and

To click on Link 2 otherwise.

For choice 2 you tell the user:

To click on Link 3 if he or she has never used an automatic handgun; and

To click on Link 4 otherwise.

1. Link 1 = Background information on handguns and automatic handguns plus handgun safety rules. (A link back to the mainstream presentation is also included.)
2. Link 2 = Click on Link 3 or Link 4.
3. Link 3 = Background information on automatic handguns plus handgun safety rules. (A link back to the mainstream presentation is also included.)
4. Link 4 = Handgun safety rules only. (A link back to the mainstream presentation is also included.)

For 1, those who have never used a handgun are given sufficient background information on both handguns and automatic handguns to understand the safety rules.

For 2, those who have experience with handguns get another choice (i.e., 3 and 4).

For 3, those who have no experience with automatic handguns are provided with introductory background information plus the safety rules.

For 4, those who do have experience with automatic handguns are not bored with the introductory background information and just get the handgun safety rules.

This set of four links is deeper branching than the first set of two links but is probably still easy to understand. Some users are only two branches away from the mainstream, others only one branch away. But you can see where deeper (more complex) branching will take a user. Sooner or later, the WBT course will become too complex to use easily as the branching goes deeper. Therefore, keep it shallow and keep it simple.

Notice that the links determine the structure of this short tutorial. It doesn't matter where these Web pages are stored (i.e., in what folder). What matters is the structure that the links create.

Difficult to Create, Difficult to Use

It might be appropriate to point out that deep branching is difficult to create as well as difficult to use. With each new branch, you at least double the possibilities. If you make your branching too deep, ironically the WBT course may become more difficult for you to create than for the user to use, perhaps not a good direction in which to go.

Keep your WBT course with a mainstream orientation. Never stray too far via branches from the mainstream presentation. Make sure the users always perceive exactly where they are in your WBT presentation.

Simulations

Simulations are an exception to the linear rule. In simulations, students make multiple choices, which lead them in unique directions. Thus, the choices determine the path the student takes through the simulation. If the simulation is complex, no one student is likely to take the same path through the simulation as another. But each path is a valid learning experience, and there is

no compelling reason for any one student to take the same path as another (see Figure 10.5).

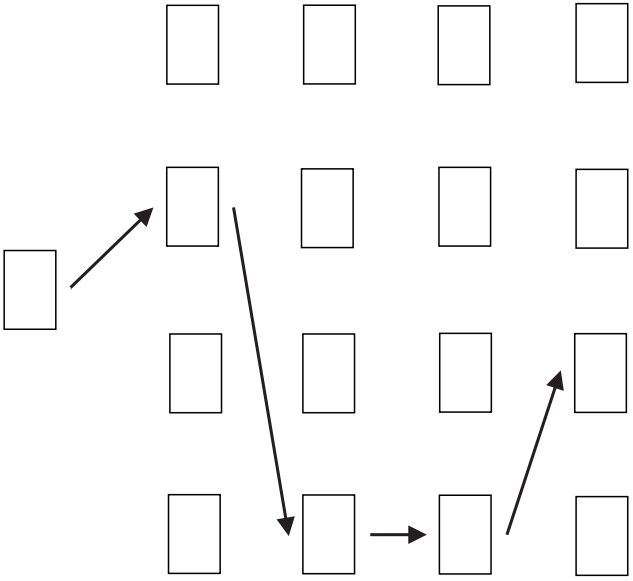


Figure 10.5 A simulation diagramed to show the unique path of one student through the web of choices.

There is no block of information to be taught and tested. A simulation seeks to provide practical experience, to simulate the real world rather than present theories with supporting information.

A student is unlikely to get lost in a simulation, because a simulation always moves forward to an eventual conclusion. Thus, although the simulation appears to be Web-like, each student feels as though he or she takes a linear path through the simulation.

It is worth commenting that simulations are often huge and expensive projects. If you contemplate creating a simulation, make sure you understand the scope of what you are doing before you commit to it.

Simulations are similar to games, and there is a huge, rich, and robust digital game industry that has a life of its own both on and off the Web. If you're interested in simulations for training, look to the digital game industry for information on what the possibilities are.

Usability

When the Web was new in the mid 1990s, website usability was guesswork for most Web developers. Naturally, people started doing usability research, and today we have some usability guidelines. One of the leaders is User Interface Engineering (*http://www.uie.com*). Read their book *Web Site Usability: A Designer's Guide*, Spool et al. (Morgan Kaufmann, 1998). Another popular book is *Designing Web Usability*, Nielsen (New Riders, 2000).

Because this is not a usability book, we cannot devote the space necessary to providing you with a thorough understanding of this very important topic. Nonetheless, usability is important to WBT. Most professional instructors strive to be interesting and clear in the classroom so as to make the educational process more palatable for students and thus more conducive to learning. The same is essential for WBT. The usability of a WBT presentation is analogous to the capability of an instructor. Consequently, we will cover some usability highlights but will leave you to devote yourself to further research on this topic. The references in the preceding paragraph are a good place to start.

Tied Together

Usability, interactivity, and navigation are all tied together and are essentially three facets of the same thing: organizing information in such a way as to be digestible for consumers. In this

case, the consumers are the students of your WBT.

Links

As the structure of your WBT presentation, links hold the presentation together. Therefore, the links take on primary importance.

Navigational Links

Navigational links carry your students through your WBT presentation. Thus, you need to make sure the navigational links are straightforward and simple to understand.

If you create a WBT presentation that requires substantial training just to use the presentation, you will lose a lot of students.

Common Links

A Web page navigation bar that takes students to common places inside the WBT presentation, such as the beginning of the presentation, the beginning of a chapter (section), the top of the page, or a "sitemap" map of the presentation, makes the presentation easier and more convenient to use.

Convenience Links

Links to references, such as information at a specific website, save your students a lot of trouble. For instance, suppose you have a footnote that references an article in the Encyclopedia Britannica. The footnote can be a link that goes directly to the article on the Encyclopedia Britannica website. Such links provide a convenience but aren't necessarily a part of the WBT presentation navigational system.

Gratuitous Links

You've seen websites with lots of irrelevant or quasi-relevant links to other websites. This practice has no place in WBT presentations. If you provide lists of links to other websites, they should be relevant to the presentation and grouped into labeled categories so that students can more easily use them.

Link Tips

Some tips for making links usable for students follow:

- Avoid using images as links. Words are better (more self-explanatory). However, image links for standard navigation that a students uses throughout the WBT presentation (e.g., on a navigation bar) are appropriate.
- Don't change the default link colors (blue for unused links and purple for used links). People understand the default colors (assuming they have Web browsing experience). Don't confuse them by making changes.
- Don't be afraid to use long links. The more words in a link, the better, so long as the words make the link destination more self-evident.
- Don't allow links to wrap to a second line; that is, keep links to less than one line.
- Don't use ambiguous terms for links. Who can guess where such links go?
- Make the links distinct from each other. Students who perceive link terms (words) to be similar will wonder where they go. (Presumably, they don't go to the same place.)
- Don't surround links with text, if avoidable, unless the surrounding text helps describe the destination of the link. In

other words, make links separate words, phrases, sentences, or lists. (Note that links inside text blocks that are a different color from normal text interfere with readability.)

- Use links to destinations within the same Web page carefully. They have the potential to cause much confusion.
- Use links to destinations outside your WBT presentation carefully. They have the potential to cause much confusion (i.e., more so than they would in a website presentation).
- Use as few links as possible on each Web page. Too many links can overwhelm students or lead to confusion.

Navigation

The links between Web pages define the structure of your WBT presentation. The links also define the navigation. The navigation (movement) around the structure must be simple to be usable.

Hierarchical Navigation

Research shows that the best structure for easy navigation is a hierarchical structure.

We organize information in a hierarchical structure based on the outlining we learned in fifth grade. We live with hierarchical structure through school papers, text books, reports, maintenance manuals, and almost every form of routine written expression. We understand it, and we create it.

Now we have the Web, which enables *web* structures. But we have not grown up with web structures, and we still use the hierarchical organization of information. While following our curiosity from link to link through an infinite web is conducive to learning, it is not an efficient way to learn a well-defined body of information or

knowledge. A hierarchical path is more understandable and easier to use. It is also essential to ensuring that all the key learning points are presented to all students.

That is not to say that we have to absolutely stick to a hierarchical organization. On the contrary, experimentation is the order of the day for WBT. But if you stray too far from hierarchical organization, you may lose your students to frustration and anger.

In the Future?

Perhaps with the Web, students in the far future will get away from the hierarchical organization of knowledge. But if that ever happens, it's a long way over the horizon.

The diagram shows how a WBT presentation on the US Government might be organized (see Figure 10. 6). The judiciary includes the court system. The executive includes the federal bureaucracy. The legislative includes the Congress.

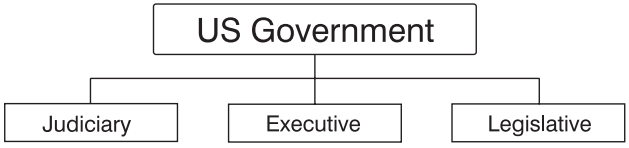


Figure 10.6 The hierarchical structure of a US Government presentation.

More detail reveals a further blossoming of the hierarchical structure (see Figure 10.7). The diagram starts to look like a tree. The judiciary is broken into its three component parts. The executive is broken into the Cabinet positions representing the various departments in the federal bureaucracy. The legislative is broken into the House, Senate, and the Joint Committee, which reconciles legislation passed by both bodies.

More structural detail for the WBT presentation on the US Government:

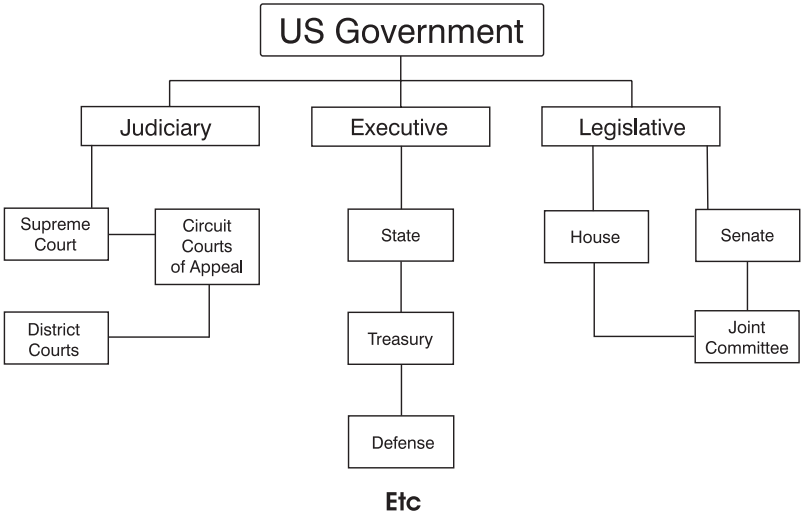


Figure 10.7 US Government hierarchy with more detail.

Finally, more detail on the Department of Defense reveals a further blossoming of the hierarchical structure (see Figure 10.8).

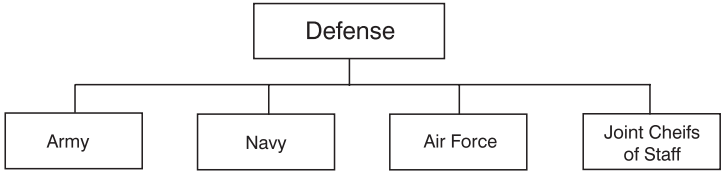


Figure 10.8 The structural detail for the Defense Department.

Ironically, these diagrams show a lot of branching, hardly conducive to the linear path that education commonly follows and more like the nightmare of excessive branching. But we intuitively know how to present this so students don't get lost in the branches. We

turn the tree on its side and systematically go through the branches one by one.

US Government

Judiciary

Supreme Court

Courts of Appeal

District Courts

Executive

Department of State

Department of the Treasury

Department of Agriculture

Department of Transportation

Department of Justice

Department of Defense

- Army
- Navy
- Air Force
- Joint Chiefs of Staff

Department of Commerce

Department of Labor

Department of Health and Human Services

Etc.

Legislative

Senate

House

Joint Committee

This organization makes sense out of a lot of diverse information. It looks like a book or course outline. Students understand it and can proceed through it on a linear path to digest it. Likewise, a WBT presentation on the government might be similarly organized.

The genius of the Web enables links that defy the hierarchy. For instance, the Joint Chiefs of Staff interact with committees of both the Senate and the House to prepare annual budgets for the military. This is a very important relationship (as money always is). Links between the information on these governmental entities, not in the same branches of the hierarchy, are perfectly legitimate and desirable for learning. Nonetheless, if all links were added that were deemed desirable, the structure would start to look like a web instead of a hierarchy. The task of, the challenge of, the art of WBT is to strike a balance between the use of these two approaches to structure: hierarchical and web.

The message of usability studies is to use hierarchical navigation to enable students to move efficiently through the body of information presented. Ironically, the stronger and more self-evident the hierarchical navigation structure, the more nonhierarchical links can be included without confusing and frustrating students.

Nonhierarchical Navigation

Notwithstanding that hierarchical navigation is generally more comprehensible, such structure may not be the best approach for all types of information or knowledge. The advent of the Web is our opportunity to experiment with new approaches to learning not before possible. But when you find that you have strayed too

far, return to hierarchical structure and the understandable navigation that it fosters.

Metaphors

Many Web experts will tell you to use a metaphor for your WBT presentation. For instance, for a WBT tutorial on dealing in agricultural commodities, you might use a farm as a metaphor. Thus, your WBT presentation becomes a farm where you conduct various training activities (e.g., information on raising hogs takes place in the pig pen). This is a great idea and can work well. Unfortunately, many metaphors are trite and fall flat. They inevitably require much special artwork. If you have the budget to make a metaphor work and can come up with a fresh idea, give it a try. Otherwise, forget it. Your WBT training doesn't have to be a metaphor and most likely is better off not being one.

Apply these tests to your metaphor idea:

1. Will the metaphor require a lot of artwork? Can the budget cover the cost of the art? Will the artwork delay the completion of the project? Will stuffing the content into the metaphor container delay the completion of the project?
2. Is the metaphor fresh? Or, does it smell like five-day-old, unrefrigerated sushi?
3. How much does the metaphor add to the understanding of the WBT content? To the navigation? Does the metaphor have to be explained?

If you have a well-defined theme for your content (i.e., a clear presentation topic), you don't need a metaphor to hold your presentation together. If you don't have a well-defined theme for your content, nothing will hold your presentation together. In other words, a metaphor is superfluous.

Many WBT presentations don't use a metaphor for their content presentation but a few use one for their artwork or infrastructure. For instance, the place where you read and answer questions becomes a simulated spiral-bound notebook. And an entire WBT presentation takes place in a 3D virtual classroom. This is goofy. If that's all you can think of, let it go. Prepare a Spartan presentation instead—unless you have a large budget.

Other Factors

Other factors affect usability too. This section presents a few. You should always be on the lookout, however, for books and articles that bring new Web usability considerations to light.

Graphic Design

Graphic design, as a Web page design element, doesn't affect usability one way or the other. All-text Web pages can be just as usable as ones loaded with images or graphic design elements.

Scrolling

Many Web gurus claim that Web pages that a user doesn't have to scroll are more usable. There is no empirical evidence to support this one way or the other. You can expect your students to be used to scrolling at websites and that they won't mind scrolling in your WBT presentation Web pages.

However, rules (long horizontal lines) may stop your students from scrolling further, even though there is more text below. So, forgo the use of rules except where you have a specific and appropriate purpose for them.

Download Time

Download time is an important factor when using a website. That doesn't necessarily mean the same thing for WBT presentations. When people use websites, their use is usually elective. If the download is too long (more than 10 seconds on a 56K modem, about a 34K file), the reward of the information sought may not be perceived as commensurate with the wait.

For a WBT presentation, however, the psychology may be different. The student motivation to get the information may be assumed to be higher than the typical Web surfer, and a long download time may not be a serious deterrent to a satisfactory student learning experience.

Nonetheless, keep download times as short as possible for your entire WBT presentation. This is an overall design consideration. When you have something of value to provide on a particular Web page that requires an image or Java applet, though, don't be afraid to include it.

Movement

Movement can be terribly distracting. Do not encumber your Web pages with DHTML or animations that just keep on going. Students will go nuts trying to read your content unless the movement is accompanied by coordinated sound (e.g., a dynamic bar chart with audio explanation). Instead, if you have an animation that contributes to the learning process but doesn't have coordinated sound, give students the capability to turn it on and off.

Bottom of the Page

Students will expect to find a navigation bar at the bottom of the page. Give them one. Also give them one at the top of the page for convenience.

Storage Structure

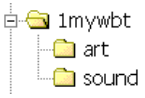
Storage is simply where you keep your website files, that is, in what folders you place them. For a WBT presentation with under 20 files and 20 images, store everything in the same folder. For higher numbers of files, you can sort them into specialized folders that remind you where to find them when you need to work on them.

File Storage for Web Presentations

File storage for Web presentations is a subject you probably mastered before you started reading this book. Nonetheless, it is important to cover it briefly here merely to point out that storage structure has nothing to do with the structure of the WBT presentation itself.

Storage by Media

Make subfolders for art, sound, and video and store the appropriate files there. That will help you find media files quickly, and you can keep all the HTML files in the primary folder.

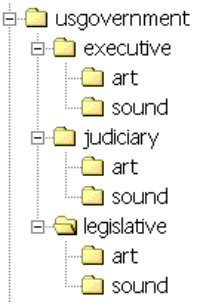


Storage by Sections

Divide your WBT presentation into sections and make a folder for each section. Store all your files for each section in the appropriate folder.

Storage by Sections and Media

Divide your WBT presentation into sections, make a folder for each section, and store the HTML files for each section there. For each folder, make subfolders for art, sound, and video, and store your media files for each section in the appropriate subfolders.



Not Website Structure

As you can see, a comprehensible folder system is handy for storing the files that make up your WBT presentation. Again, however, be aware that storage structure is not the same as WBT structure. The links in your WBT presentation determine its structure, and the links do not necessarily have anything to do with where the files are stored.

Testing

Testing is the proof of your pudding. Test your WBT presentation before publication based on the following digital factors that apply to your audience:

- Different computers
- Different operating systems

- Different browsers
- Different connections

If everyone in your organizations uses a standard Dell laptop, a 56K modem, Netscape Communicator, and Windows 2000, your testing chores will be easy. If instead you offer your WBT presentation to the general public, you will have a large testing project to conduct.

The goal of testing the efficiency of your digital presentation is to make sure that the interactivity, usability, and readability are conducive to easy learning. Consequently, this book can help you devise appropriate testing.

Such testing does not include the evaluation you will also want to do separately to ascertain the efficiency of your instructional content such as testing different students with different learning styles. This is something that every instructor should do regardless of teaching in a classroom or on the Web.

Summary

Interactivity (choices via links) is one of the great capabilities of the Web. Use it. But keep the branching shallow. Keep the movement through your WBT presentation linear, except for simulations.

Usability depends on the organization and navigation of your WBT presentation. Make it hierarchical, a means of organization most students inherently understand.

Don't confuse your Web page file storage arrangement (on the hard disk) for the structure of your WBT presentation. The file storage arrangement is for your convenience and does not affect students. The structure of your WBT presentation is created by your links and is crucial to the way students use the presentation.

Using beta testing to determine the usability of your WBT training presentation is essential but should not be confused with evaluating your WBT presentation for its educational effectiveness.

11

Supplementary Protocols

The Web runs on HTTP (Hypertext Transport Protocol), and with the name of our education medium being "Web-based training," you would think that was the end of the story. It's not. There are other Internet protocols and devices important to WBT. In fact, WBT is an umbrella term under which falls every Internet device we can use whether covered by this chapter or not.

Email

Can you have WBT without the Web? Certainly. What we generally refer to as WBT, however, started out as email, and email remains an important component of WBT. In the 1980s the University of Phoenix conducted courses in its off-campus business curriculum using email as a significant component and still does so. Such an online approach to providing education was a precursor to WBT, and email remains an important potential component when developing WBT presentations.

Why? Email provides a *convenient* and *inexpensive* way for instructors and students, and for students and students, to communicate. Convenience is important, and because an email communication does not take place in real time, it is convenient for both the sender and the receiver. Expense is also important. Email costs little and usually comes in a package with other services such as Web access. For most people email use is unlimited. Consequently, plenty of email costs no more than a little email.

Email is effective too. Written communication works well and even leaves a record that with proper planning can be used by students.

Web Email?

Most email clients today read HTML email. That means that you can send an HTML presentation (a Web presentation) as an email. You have probably received a few. This particular variation of email has much potential for WBT.

Perhaps most important, email can provide a human touch to an otherwise totally digital environment. The capability for a student to communicate with the instructor not only can lead to better instruction but gives the WBT a human dimension. Indeed, perhaps the biggest drawback to email is that an instructor may be

overwhelmed with email from students (i.e., email that needs to be answered). However, the mailing list covered later provides a tool that instructors can use to reduce their chore of answering email.

When

When do you include email in WBT? That's a judgment call. Probably there are correlations with size and complexity. The larger a WBT presentation, the more likely the need for an active instructor. The more complex a WBT presentation, the more likely the need for instructor assistance.

Someone in Charge

For a simple WBT tutorial, put a person in charge, even if the person is not an instructor. Provide the person's email address for students to contact when they have questions. If the person in charge gets too much email, you know it's time to improve the tutorial or provide an instructor for the tutorial.

What

What do students and instructors do with email besides communicate? They exchange information. For instance, an instructor can send an assignment to all the students and even attach educational materials to the email message.

A 500K attachment is not unusual for an email message, and an ASCII file that size could easily contain a complete book. Thus, email can be an effective distribution mechanism as well as a means of communication. Indeed, if you look under the hood of some WBT systems, you may find more email than HTML.

How

How does an instructor handle email traffic? The direct answer is: canned responses. The person in charge of a WBT presentation or an instructor assigned to it should have ready a series of responses to typical questions. Then answering most questions is just a matter of cutting and pasting. A posted FAQ (frequently asked questions) helps reduce message traffic too.

Keep in mind, however, that reducing message traffic and increasing efficiency is not always the goal. Sometimes you want students to communicate more with the instructor, and you encourage them to do so.

Mailing List

A mailing list is simply a list of email addresses to which your message is automatically sent from your email client via a mail server. You send only one message to the mail server. For instance, you send one message to *class503@happytraining.com* to your WBT course classmates. It goes to the mail server at Happy Training, which in turn automatically sends it to your classmates:

carol@bizmark.com

fred@psa.com

george@ssta.org

susan49371@aol.com

instructor-sam@happytraining.com

Thus, everyone in the group sees your email message. Anyone can reply, and everyone in the group sees the reply too. Some other names for mailing lists are forums, newsgroups, listservs, and discussion groups.

A mailing list provides a means for an ongoing group discussion. What a great invention for online education! A mailing list enables an instructor to conduct a class online in *convenience time* rather than real time. The discussion moves forward at everyone's convenience.

Critical Mass

Unfortunately, a mailing list doesn't automatically work well. How well it works depends on the aggressiveness and enthusiasm of the students, and the moderating and teaching skills of the instructor. (A mailing list usually has a leader called a *moderator*.) Margaret Levine Young, author of *Poor Richard's Building Online Communities* (Top Floor Publishing), says that most mailing lists require at least a 10:1 ratio of total participants to active participants. Thus, under normal circumstances, if you want to have a lively discussion between six or eight students, you need a critical mass of at least 60 to 80 students or more on the mailing list. If the group is passive, you may need hundreds on the list to get a good discussion going.

The 20/80 Rule

About 20 percent of the students do about 80 percent of the voluntary class participation in a classroom. In a classroom, however, the instructor can call on the other 80 percent of the students in order to increase the percentage of student participation. On a mailing list, the instructor may have to make a diligent effort to get everyone involved in the discussion. It won't necessarily happen automatically.

How does one make a diligent effort? That's up to the creativity of the instructor. Different things will work for different classes.

The success of the group discussion depends a lot on the tact of the instructor. It's much easier to offend someone on a mailing list than it is in person where body language and facial expressions can be read by students. An instructor must be sensitive, supportive, and noncritical at all times on a mailing list. A critical instructional style that may work well in the classroom is certain to make everyone angry on a mailing list. Ms. Young says that an instructor needs to use an almost apologetic tone in moderating a mailing list. Anything less may be interpreted as tactless.

Another problem an instructor must look for is student antagonism. As soon as two students start showing anger toward each other in their exchanges on the mailing list, the instructor needs to intervene tactfully to cool things down.

Instructor Training

Many WBT instructors are experienced participants in mailing lists and may even have moderated a mailing list. They will presumably manage WBT mailing lists well. Other instructors without such experience need to be trained how to moderate a mailing list. You cannot assume that inexperienced instructors will do a good job, and a mailing list run amuck will wreak havoc with your WBT program.

Bulletin Board

Mailing lists do not have to be group discussions. They can act as a bulletin board for the WBT course. The instructor can use a mailing list to distribute educational and administrative materials. In addition, students can ask occasional questions to be answered by the instructor. This approach adds value to a WBT presentation but does not rise to the level of a group discussion.

Variations

Mailing lists use the email protocol, and participants must use an email client (separate from a browser). Such client software comes free with the Netscape and Microsoft browsers. It is up to each individual student to keep track of the messages. Some students will be very organized and will keep all their WBT messages together. Other disorganized students will probably read each WBT message as it's delivered but will not be able to find it thereafter.

Newsgroups use the news protocol, which provides a system especially designed to handle discussion traffic. Each email message goes into a "thread," and all the messages of a thread are stored together for reference. For instance, in a WBT presentation on gourmet cooking, the students might have a lively discussion on preparing rack of lamb and another on cooking custard. The messages for each of these discussions would be stored under its respective thread: *Rack of Lamb* or *Custard*. A student interested only in lamb can go to the Rack of Lamb thread and read only the messages on preparing rack of lamb. Another student interested only in desserts can go to the Custard thread and read only the messages on cooking custard.

The newsgroup system requires a newsreader (separate from a browser). Such readers come free with Netscape and Microsoft Web browsers.

There is also threaded email discussion software that runs on the Web protocol such as WebBoard (*http://www.ora.com*). This is not the most efficient way to run threaded discussions, but it works just like the newsgroups. Messages are stored in threads according to discussion topics. The advantage to WBT of using Web threaded discussion software is that it runs in a browser. You don't have to use a separate email client or newsreader to take part in

the online discussion. Unfortunately, writing email via Web discussion software in your browser is often more awkward than using an email client.

Archives

The stored messages of many lively online discussions held during WBT often comprise a valuable educational resource. It's almost like having a sound recording of every classroom session. One can go back and read all the messages to learn from a discussion that ended long ago. Don't overlook an email archive as a useful resource for students.

Chat

Chat is real-time written communication online and requires the use of chat software. Those who strive to make WBT a duplication of the classroom experience look to chat as the saving grace. After all, everyone is together chatting (albeit in writing) via the Internet. But chat tends to be awkward and slow. It's a meager imitation of normal human conversation.

It seems to us that one great advantage of WBT is convenience. The students and the instructor don't have to be together in the same place at the same time. They participate when it's convenient for them. Therefore, chat seems to be a regression. Nonetheless, chat has its place in WBT. When you need to have a group discussion in real time, chat can provide that capability.

For chat, each student must have the chat software. Fortunately, you can deliver that software via a Java applet into students' browsers. Thus, you can get everyone together online via their browsers to participate in the chat session.

Net Phone

Using an Internet telephone is just like Web chat except that it's real conversation, not writing. Unfortunately, Net phone has not yet reached the level of quality that we have come to expect from the telephone. In addition, each student must be set up with the proper equipment (i.e., a microphone and speakers) and software (see Figure 11.1). In spite of that, Net phone is here to stay, and its use will dramatically increase in the near future.

Figure 11.1 Net2phone Internet telephone.

Net phone requires wide bandwidth to achieve quality comparable to normal telephone service. As more people use wider bandwidth, Net phone will come into mainstream use.

Keep in mind that wide bandwidth (cable, DSL) is always on. It's not just dial up when you need it. The connection to the Internet is constant. Net phone will thrive in a system where the users are online 100 percent of the time. Why? You can ring up someone just as you do on the telephone. Wider bandwidth will also make it practical to use Net phone at the same time you use other Internet protocols (e.g., the Web).

Make no mistake, Net phone will become an important potential element of WBT in the future. It is more compelling than chat and

easier to use (once set up properly). It is essentially just the telephone in a new venue.

Telephone

One of the most effective and widely used techniques for WBT is the telephone. So long as each student has two lines—one for Internet access and one for talking—using the telephone and the Web at the same time makes a powerful yet easy-to-use WBT combination. You would be surprised by how many WBT presentations use this simple technique. The telephone, of course, requires a real telephone but requires no special software.

This can be an expensive way to conduct WBT if students are geographically dispersed and long distance calls are required. But it still may save money over bringing the students together in one location for a traditional class.

Teleconferencing

A loose definition of teleconferencing might include some jury-rigged Internet protocols, but most people use special videoconferencing software, which incorporates both sound and video. Keep in mind, teleconferencing is real-time group discussion. Videoconferencing has tremendous potential for WBT but it depends, of course, on students being able to use wide bandwidth.

Videoconferencing

Videoconferencing not only requires enough bandwidth to carry the 30 frames per second of television but must carry voice as well. Consequently, high-quality videoconferencing is strictly restricted to wide bandwidth. Videoconferencing works

poorly at low bandwidth with low frame rates and is generally unacceptable for business or training use.

Currently, computers cannot handle full-frame-rate video (without help from optional video cards). When most computers operate over 1 GHz, however, and broadband is ubiqitous, video will be a more viable digital medium.

Undoubtedly, those who see chat today as the best simulation of the traditional classroom environment will applaud the advent of high-quality videoconferencing as the ultimate in WBT. And the prospect of high-quality videoconferencing is indeed exciting for WBT. However, as pointed out earlier, videoconferencing is in real time, requiring everyone to be together online at the same time.

Note that low-quality (low frame rate) Internet video conferencing has been around for a long time. Such programs as CUSeeMe (*http://www.cuseeme.com*) provide the functionality that promises to be more valuable when everyone has wide bandwidth (see Figure 11.2).

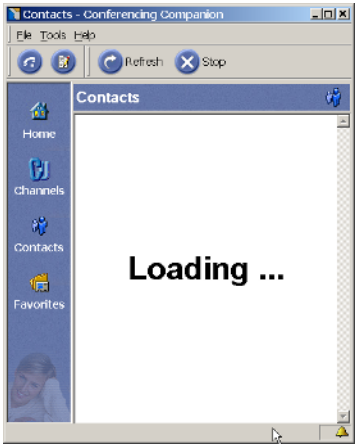


Figure 11.2 CUSeeMe Web teleconferencing software.

This dichotomy between convenience (not in real time) and the desire to simulate the normal classroom environment (in real time) will be with us forever. Right now with chat being the only effective real-time communication medium, the dichotomy is not so apparent. Chat is not very compelling. But videoconferencing is compelling and will become widely practiced by the end of the decade.

Whiteboard

The whiteboard is a real-time medium of its own. You write or draw on the whiteboard, and everyone online with you immediately sees your writing or drawing. You can also post graphics (e.g., photographs) on the whiteboard. Thus, the whiteboard is like a blackboard and like a bulletin board. You need whiteboard software (comes with Netscape and Microsoft browsers) to use it. It provides yet another means of communication for WBT presentations (see Figure 11.3).

Figure 11.3 Microsoft NetMeeting whiteboard.

Keep in mind that the whiteboard is something you use with chat, Web phone, the telephone, or videoconferencing. You don't use it alone, although it might be possible to use it by itself, albeit awkwardly.

The whiteboard, unlike in a normal classroom environment, can be a collaborative medium. In a normal classroom, the instructor writes on the blackboard, and the students mostly observe. They can't all conveniently make contributions on the blackboard. But online, the students can contribute to the whiteboard as easily as the instructor.

A Teaching Innovation

The capability of students to easily and conveniently share the use of a whiteboard with the instructor and other students is a practice a little awkward in the classroom but natural online. This is more than a technical innovation. It's a teaching innovation that offers potential online but is not widely used offline. Instead of trying to simulate the classroom, the whiteboard provides the opportunity to do something different that has great potential for interactive learning.

With the Web

All of the foregoing devices primarily enable students and instructors to communicate. Where's the content? The answer is that the content is on the Web and that you use the communications media together with the Web, not in place of it.

For instance, you can discuss things in a telephone conference while looking at content via your Web browser. You can even look at multiple quantities of content by opening multiple browser windows, each showing a different URL. At the very least, the WBT

presentation itself is on the Web, even if not accessed simultaneously, and the teleconferencing is the communications medium that enhances that WBT presentation.

Temporary Website

In the mid 1990s, Oracle made a Web browser that also included a Web server. Not only could you browse, but you could publish on the Web at the same time. You can easily do the same today, although Web servers are separate software from browsers. Windows Web servers such as WebSite (*http://www.ora.com*) are easy to install and operate.

Remember that you can use any software, whether client or server software, on any computer on the intranet or Internet, and you can even use a client and a server simultaneously (e.g., a Web browser and a Web server). Consequently, you can bypass normal Web publishing on a 24 × 7 Web server (typically provided by your intranet or by a host ISP) and use your own Web server to publish on the Web for your students. You may even find this a little easier than uploading Web pages to a remote Web server.

Is your website on your own Web server permanent? It can be if you're on an intranet and you keep your computer running 24 × 7. If you have a dial-up connection to the Internet, however, your Web server will be available only when you are connected. Of course, anytime you shut down your Web server (as you close any other software) or anytime you turn off your computer, your website will disappear regardless of whether you are connected. So, you have complete and immediate control over your private website.

Consequently, you can provide a temporary Web presentation to your students that is not necessarily available 24 × 7. Why would

you want to do this? There might be numerous reasons, including the following:

1. You don't want to make your teaching materials available full time in order to reduce the risk of theft (i.e., copyright infringement).
2. Your teaching materials contain sensitive or confidential information or data that you want to keep out of public view as much as possible.
3. Running your own Web server is more convenient than using a host ISP's Web server.
4. You are an experienced computer user and want to use special Web software not available using a host ISP's Web server.
5. You feel it one of the best ways to give students an online exam.
6. You're tired of dealing with the meatheads in your IT department.

Generally, it's not advisable to run your own Web server. But if you have a special reason, it's a possibility for you to do so, particularly on a temporary basis.

Play by the Rules

We're not advocating that you run your own Web server. Indeed, your company may have network rules that discourage you from doing so. Check with your network administrator to determine whether you can do it and whether there are any special considerations you need to keep in mind while running your Web server.

Still, if you have a reasonable need to run your own Web server, particularly on a temporary basis, insist that your net-

work administrator find a way to accommodate you. The network exists to serve employees and the organization, not vice versa, and running a temporary Web server can be useful.

You will find that your biggest problem is not running your Web server. Your biggest task will be ascertaining your Web address (URL) and the path to the folder that comprises your private website. You need these to set up your Web server, and you need your correct URL to give to your students to access your website.

When you run a temporary website, you need to communicate to students when and for how long it will be available. Most will expect everything to be available 24 × 7, and running a temporary Web server is a little out of the ordinary.

Multiple Programs

PCs and Macs can multitask; that is, they can run multiple programs at the same time. This is significant for WBT. For example, running a Web browser and a Web server at the same time is essential for the temporary website idea discussed earlier. In fact, a modern PC runs many programs at the same time, most of which we aren't even aware.

Suppose you want to develop a course in finance. You plan to use Web phone, the Web, and a whiteboard to conduct the course online in real time. In addition, you expect students to use a spreadsheet (e.g., Lotus 123) for financial analysis and a database manager (e.g., Access) to manipulate data to be used in statistical analysis regarding certain financial analysis models. Hence, you expect a student to run Web phone software, a Web browser, a whiteboard, a spreadsheet, and a database manager (and probably a word processor to take notes), all at the same time. Is this possible? Indeed it is. This is not only possible but practical. It demon-

strates how powerful PCs (and Macs) can be when used for educational purposes. Each program runs in a different window ready to be used when necessary.

And if you don't like this example because it's too high tech, how about twenty browser windows, each with a different art museum loaded. Then, too, an art student would have a color wheel program opened ready to analyze color and a copy of Adobe Illustrator opened ready to do some sketching.

Alas, the Achilles' heel of this idea is that in a class of 20 students, you cannot expect everyone to use the same software. Some art students will want to use Adobe Illustrator, some Macromedia FreeHand, and some CorelDraw. But the future is bright. There will eventually be Java software that you can license and distribute, via the Web, to students. It reduces the cost of the course for students (they don't have to buy software) and gets everyone in the same boat. For instance, a multitude of Web photofinishers and other websites (e.g., eBay) already offer powerful Java photo editing software for patrons. Such software could just as easily be used by art students in a WBT course.

Collaboration Software

It's evident that if students can communicate, they can collaborate. Using the various means of communication, students can work together on educational projects and otherwise collaborate, presumably under the guidance of an instructor. The Internet was intended as a collaboration tool from the very beginning. Today there are plenty of collaboration tools (e.g., Web, email, mailing lists, etc.) to facilitate collaboration.

In addition, dedicated collaboration software is available that runs on the Web and enables people to work together. If part of your

WBT structure is to have students collaborate on projects, it may be worth the investment to obtain collaboration software that will make collaborating more convenient and productive. The caveat to keep in mind is that millions of people have decided to forgo such dedicated software simply because the tools of the Internet are effective, easy to use, and already in everyone's hands.

Summary

When we say "Web-based training," that's really not what we mean. We mean Internet-based training. Even though the Web is in the spotlight, it is just one Internet protocol useful for online training. Other Internet protocols are valuable for online training too. For instance, email is an old workhorse for online training, and its successful use predates the Web.

Do a survey of other Internet protocols to determine whether there's one that fits your needs. The combination of Internet protocols you use for your WBT should be one that fits your needs and the needs of your students. It will not necessarily be the same combination that another instructor or developer uses.

12

Types of WBT

What are some specific forms a simple WBT course might take? As mentioned in Chapter 9, this book does not cover comprehensive WBT, which might include such features as automatically graded exams together with other course administrative features. But there should be more than plain text or else a WBT tutorial looks like nothing more than a book or a lesson plan with supporting text.

Within the scope of this book, what do you have to work with? Try ideas from the following multimedia elements:

Interactivity

Text

Voice (and sound effects)

Video

Embedded programming

Online software

Data

Dynamic devices

As Chapter 9 suggests, it makes sense to compare Web multimedia elements to a basic text presentation such as a book. Therefore, in this chapter, a book (text-only Web presentation) is used as a method to present the content just as a lecture in a classroom might present the content.

Anytime one discusses multimedia, the possibilities are always more than the scope of the discussion. As you progress and create specific applications, the possibilities multiply extensively. Consequently, this chapter puts forth not an exhaustive list of potential uses of media but only some ideas to get you thinking about how you might use media in your WBT courses.

Interactivity

As Chapter 10 instructs, interactivity is part of the Web architecture. Links provide choices to users. When users make choices, they interact with a WBT tutorial. The choices might be:

- To go in one direction instead of another

- To pick one answer instead of another
- To change the media currently being used
- To consult a sidebar reference
- To provide input to a questionnaire
- To provide input for an embedded program

Interactivity supports three interesting ideas. First, it draws users into the presentation as a participant. It is more difficult to fall asleep when one is a participant. Second, it enables the creation of an educational device that can automatically customize the learning experience to a specific user. This is often expressed as enabling a user to progress at his or her own pace. Third, interactivity can enable the student to learn by doing instead of merely reading, viewing, or listening.

Interactivity can be trivial or overwhelming, but one expects it to be more than trivial for a WBT tutorial. After all, a book features trivial interactivity (e.g., sidebars, footnotes). We expect something more than a book.

Text

Can you create a WBT tutorial with just text? The answer is an unequivocal yes. With just text and links, you can create educational products that offer more than the trivial interactivity of a book.

Questions & Answers

You can ask questions. You can give answers. Although you can do this in a book, you can do it more conveniently and effectively in a

WBT tutorial using links. There are three aspects you might consider: scope, frequency, and sequence.

Scope

The broader the question, the broader the answer. For instance, suppose you provide text on how to replace the heating element in a copy machine (made in Japan). One question might be, What's the first step? The answer: Make sure to use tools sized in millimeters instead of inches. This is a small question (small in scope) with a specific answer.

On the other hand, suppose your topic is the rise of the use of steam power in transportation in the nineteenth century. One question might be, What was the chronology of inventions that led to the widespread use of steam engines for both land and water transportation? This is a broad question (broad in scope) which requires a lengthy answer since there were a series of important inventions, not just one.

One can envision that each of these questions probably matches text blocks of different size. The first question might be most effective after just a few paragraphs that begin a guide on how to change a heating element in a copy machine. If the first question comes instead after many paragraphs of text, it might lose its effectiveness.

The second question might be most effective after many paragraphs that trace the history of the initial use of steam engines in railroad locomotives and ships. Without plenty of background information, the second question is unanswerable.

Thus, in order to be effective, generally the scope of the question needs to match the scope of the text it seeks to reinforce. And scope can generally be related to the size of the text block to which the question pertains.

Frequency

The more you incorporate questions into the text, the smaller in scope and more specific the questions need to be. This points out the difference between "programmed learning" and text books.

Textbooks often have questions at the end of a chapter. Normally, they are large in scope, overview questions. Seldom are answers also provided (except in the instructor's version of the book). Small specific questions tend to be ineffective; it's too late to reinforce the little details.

In contrast, programmed learning expressed in text has traditionally been a series of short text blocks followed by specific questions appearing immediately after. Answers are usually provided. This approach generates immediate reinforcement. Thus, greater frequency goes hand in hand with more specific questions of smaller scope.

Sequence

Questions don't necessarily have to come after the text. They can come before. For instance, you might ask a question even before a text presentation to alert users as to the general considerations the text will cover. This is a sort of quasi-Socratic approach and can be effective. Another example is a glossary approach. Provide a key word and give an initial glossary definition. Then follow through with a more detailed explanation in the text block. Yet another example is a pre-test. If a student scores high on the pre-test, he or she can make the decision to skip the content and go on to something else.

In any event, the sequence of questions—where they appear in the text—has an effect on the learning process.

Interactive Use

Using questions and answers within the chapter of a textbook is awkward. If you feature questions after just a paragraph or a few paragraphs, it seems disruptive if answers are not provided. If answers are provided in plain view, the questions are not as effective. The answers must be hidden. For printed text, hiding answers requires some type of special device (movable mask) or the placement of the answers at another place in the book. A movable mask works well until you lose it. Placing the answers at another place in the book is awkward, disruptive, and inconvenient for the user.

The Web offers a material advantage in that the answers can be just a click away via a link to another Web page.

Hence, one technique to use for interactive text is "programmed" learning:

1. Read a little.
2. Respond to some questions just a click away in another short Web page.
3. Click to go to yet another short Web page to find out whether your answers are correct.
4. Click to return.
5. Repeat

If your answers are incorrect, you have the option to go back and reread the paragraph rather than reading on, or you can study the correct answers with explanations (see Figures 12.1 and 12.2).

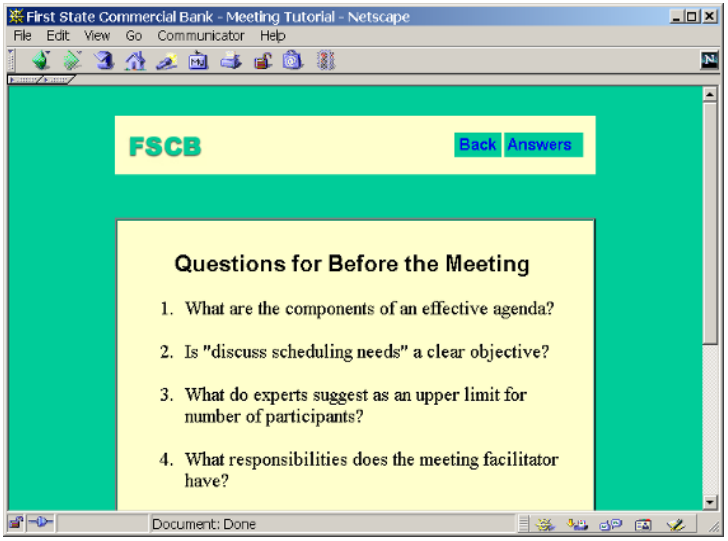

First State Commercial Bank - Meeting Tutorial - Netscape
File Edit View Go Communicator Help
FSCB
Back Answers
Questions for Before the Meeting
1. What are the components of an effective agenda?
2. Is "discuss scheduling needs" a clear objective?
3. What do experts suggest as an upper limit for number of participants?
4. What responsibilities does the meeting facilitator have?
Document: Done

Figure 12.1 The questions in the Meeting tutorial.

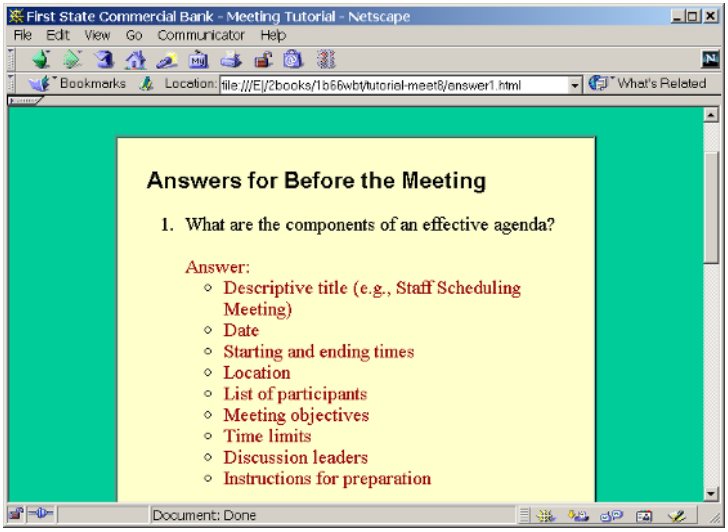


Figure 12.2 The questions and answers in the Meeting tutorial.

Another technique of interactive text is the overview question. For instance, you can put overview questions at the end of a section (chapter) but provide a list of hints to answer the questions. Each hint can contain direct links to relevant places in the text where students can find the information to answer the questions. In the case of glossary definitions at the beginning of a section, you can do more than just provide definitions. You can link to more robust but still sparse introductory information that, in effect, previews the section.

Don't overlook questions and answers when you use text for WBT. You can come up with inventive techniques to make learning more effective and more fun.

FAQ

The ever popular Frequently Asked Questions (FAQ) is found throughout the Web. It is essentially review questions together with answers. There's no reason not to use an FAQ in WBT too.

Programmed Answers

Programming enables the creation of questions that are automatically handled. Students click on a choice (e.g., true or false), and the programming automatically provides feedback. For instance, a little window might pop up with something like "Yes, you are correct! Now go to the next question." All of these can include information that reminds students of the correct answer, if the wrong answer is selected, thus reinforcing the learning process. You can do this with JavaScript, Java, or CGI (see Chapter 13). As you develop more advanced WBT presentations, you may want to hire a programmer to add this type of interactivity.

Shareware or Freeware?

You can find shareware or freeware programs that will enable you to easily create a program that asks questions, evaluates answers, and gives feedback.

Reacting to a question where a student enters text into a form is more complicated. Programming can evaluate on/off (e.g., yes or no) questions and multiple-choice questions easily enough. Written responses are not so easily evaluated, except perhaps short phrases. Thus, you could use programming to handle the answer to "Where does the copy machine heating element plug in?" when the answer is a short phrase such as "Socket B22H." And programming can give immediate feedback for the right answers where such answers are simple (e.g., true and false) and do not have to be evaluated.

You cannot use programming to evaluate the answer to, "What was the chronology of inventions that led to the widespread use of steam engines for both land and water transportation?" The possible answers are infinite and long, and the programming couldn't evaluate them competently. If the programming cannot evaluate an answer competently, it cannot provide any meaningful feedback either.

Keep in mind that evaluating answers and collecting answers are different. You can enable a student to send you the answer to a question via Web page forms, as Chapter 14 covers. Then you can evaluate (grade) it yourself. Thus, you can easily collect the answer to the question, "What was the chronology of inventions that led to the widespread use of steam engines for both land and water transportation?"

Sidebars and Footnotes

Sidebars and footnotes are interactive features of books. How can they be more effective for WBT tutorials?

Sidebars

A sidebar in a book chapter or a magazine article features information that is related to but not essential to the mainstream text. It is found inside a box or set off by some other typographic convention. Consequently, a reader can safely choose to ignore it, to read it later, or to read it now. Thus, the sidebar provides some interactivity. A WBT tutorial that presents sidebars as text blocks is no different. The interactive nature of the Web medium, however, enables the flexible use of sidebars.

For instance, rather than have the sidebar appear in the text, you can provide a link to a separate Web page (see Figure 12.3).

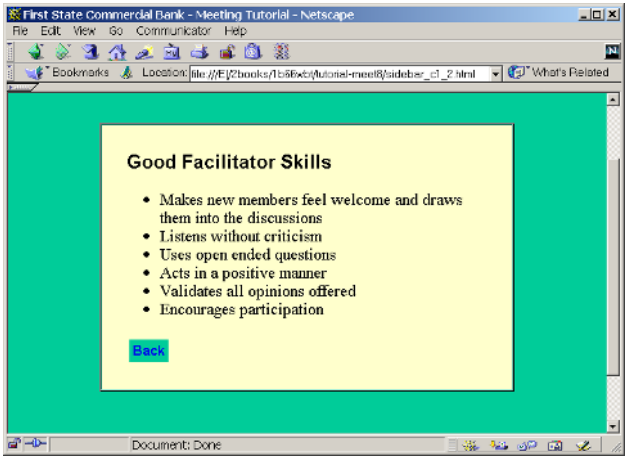

First State Commercial Bank - Meeting Tutorial - Netscape
File Edit View Go Communicator Help
Bookmarks Location: file:///E|/2books/1b5fwdr/tutorial-meetR/sidebar_c1_2.html What's Related
Good Facilitator Skills
Makes new members feel welcome and draws them into the discussions
Listens without criticism
Uses open ended questions
Acts in a positive manner
Validates all opinions offered
Encourages participation
Back
Document: Done

Figure 12.3 A sidebar in Meetings tutorial.

Now there is no limit on the size of the sidebar, although sidebars are usually short. It could be a paragraph, or it could be an article. It could even be another tutorial, or it could be another website. It could be almost anything that results in a dead end; the essence of a sidebar is that it always returns you to the mainstream. That is, a sidebar doesn't go on forever or change into another presentation; it's finite and is simply a temporary sidetrack.

Thus, you can do a lot of clever things with a Web page sidebar, but you want to make sure that the controls are in place that make it easy for the user to return to the mainstream presentation and not go elsewhere.

Change of Pace

One of the benefits of a sidebar is that it gives a student relief from the mainstream text. Thus, you might purposely add sidebars to long passages of text just to break up the text to give the reader a break. Remember, the upper limit of a student's tolerance for training is about five minutes without a change.

You can also change the medium of a sidebar. For instance, the sidebar, instead of being text, might be a voice bite or video clip. This makes a nice change of pace. The danger is that a sidebar used unwisely or the use of too many sidebars may be disruptive rather than a relief.

Footnotes

A footnote is usually a reference (citation) or a short definition (explanation), and it isn't as flexible as a sidebar. In a scholarly work, footnotes are mostly references. Many books today put all the footnotes in the back of the book as endnotes. Footnotes are interactive in that a reader always has a choice to read them or not.

In a Web page, you can provide a link to a footnote. The footnote can be in another place on the same Web page or on another Web page. It can be a reference or definition, and it can be as long as you want it to be. So, the Web provides you with more flexibility than is available in a book.

The Web is growing into a huge repository of information and data. If your footnotes refer to information available on the Web, they don't have to refer to documents or Web addresses. They can link directly to the referenced resources. Suppose you state a fact and want to refer to an article at CNET to support that fact. Instead of making a citation (e.g., Using Lasers to Cure Pyromania, CNET.com, 12-09-99), you can put in a link directly to the article at CNET (assuming CNET has it archived online). Thus, the footnote becomes the reference itself and the target of the link.

Even if the referenced work isn't on the Web, you may be able to obtain the right to reproduce it on your website. Hence, you can take a reader directly to the entire referenced work instantly via link rather than leave the reader to find the work someplace else.

Taking users directly to referenced works is not always appropriate or desirable. But when it is, you can do it with a link, something you can't do in a book.

Navigation

When is navigation interactive text? Well, navigation devices such as links present choices and thus are interactive. But there's also another level of interactivity that can distinguish WBT from books.

Normal Navigation

For the purposes of this discussion, you can consider icons used as links to be the same as text links and therefore indistinguishable from text. Links provide the navigation for a WBT tutorial, and the navigation provides interactivity. What can distinguish a WBT text tutorial from a book is that a non-linear presentation is possible. A book is primarily linear with some potential for getting sidetracked here and there. A WBT tutorial can take on just about any structure you want to give it.

It turns out that linear or quasi-linear, noncomplex structures are still the most easily understood for most types of new information. Therefore, it's advisable not to get too carried away creating elaborate web-like structures. But you certainly have a lot more flexibility in creating nonlinear structures for WBT text presentations than in creating books.

Navigation Menus Used as Quick References

Navigation menus (e.g., navigation bars) often make normal navigating more convenient. But such a menu can have a different potential use for WBT. It can act as a *standby enhancement* to a WBT text presentation. For instance, suppose you put a word in a navigation menu (e.g., the word Glossary) that links a student to a pop-up window that contains all of the new vocabulary in a Web page. A further click on a specific word in that glossary takes the student to the dictionary or glossary definition. (This system would require a JavaScript for the pop-up.) This device wouldn't work for all words, just the new vocabulary important to the WBT presentation. This makes a convenient enhancement (quick reference) of the Web page presentation that has little to do with normal navigation.

Why not make the words themselves links? That's certainly a reasonable possibility. However, you may want to make the text more readable by having fewer links in it (i.e., don't forget linked words are a different color). Or, you may want to forgo using in-text links for glossary definitions and reserve such links exclusively for footnotes, sidebars, and other more substantial information.

Suppose your WBT presentation is about common stocks and you have a menu that immediately takes a student to any one of a dozen formulas, which he or she can use instantly to make an appropriate financial calculation. That's a terrific enhancement (quick reference) but one that has little to do with normal navigation. How about a menu that links to custom calculators? That would be even more convenient than using the formulas.

The navigation menu provides you with a great opportunity to enhance text and create an educational product different from a book, more convenient than a book.

Don't Underestimate

Don't underestimate what you can do on the Web with text alone. There are endless possibilities. Text is a very fast, inexpensive, and efficient medium. Links provide an extra dimension to text, giving it more flexibility and convenience. Invent something.

Branching

Let's use the example in Chapter 10 to show how to create branching. If you will recall, the student is given a choice regarding a tutorial on handgun safety. Let's assume for this chapter that this short tutorial is inside a larger WBT course on ordnance safety. Thus, the objective is to provide a short tutorial on handgun safety

and return students to the mainstream WBT presentation. Here are the links from Chapter 10 for which you tell students:

To click on Link 1 if he or she has never used a handgun; and

To click on Link 2 otherwise.

For choice 2 you tell students:

To click on Link 3 if he or she has never used an automatic handgun; and

To click on Link 4 otherwise.

The result is:

1. Link 1 = Background information on handguns and automatic handguns plus handgun safety rules. (A link back to the mainstream presentation is also included.)
2. Link 2 = Click on Link 3 or Link 4.
3. Link 3 = Background information on automatic handguns plus handgun safety rules. (A link back to the mainstream presentation is also included.)
4. Link 4 = Handgun safety rules. (A link back to the mainstream presentation is also included.)

Let's take this branching system and show how it will work out as Web pages (see Figure 12.4).

Would You?

Would you want to be around someone who learned their ordnance safety only through WBT presentations? Would you want to work with someone who learned their corporate report formating only through WBT presentations? This calls into question the role of WBT. In the case of ordnance safety, other training is needed, preferably extensive hands-on training. For report formating, WBT is probably adequate.

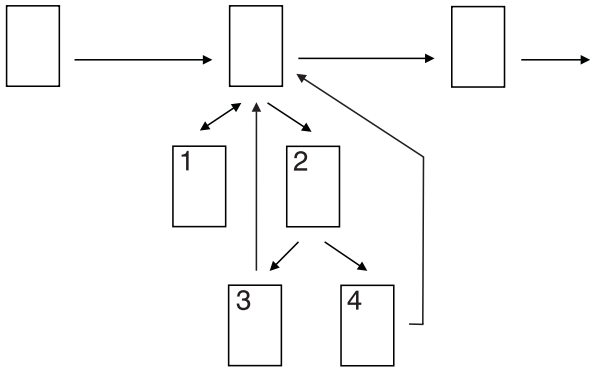


Figure 12.4 A diagram of the handgun safety tutorial.

Student Use of the Web Pages

Note that Web page 1 contains all three portions of the information, Web page 3 contains two portions, and Web page 4 one portion.

The first choice is located in a Web page, which is in the mainstream of Web pages. The links go to Web pages 1 and 2.

A student chooses link 1 and goes directly to Web page 1. This Web page contains information on handguns and automatic handguns plus safety rules. (The same information might be presented by linking Web page 1 to Web page 3, but that might be too complex.) Having completed the entire tutorial on Web page 1, the student clicks on a link at the bottom of the page and goes back to the mainstream Web page.

A student chooses link 2 and goes directly to Web page 2 where another choice awaits him or her.

A student chooses link 3 on Web page 2 and goes directly to Web page 3 providing information on automatic handguns plus safety rules. (The same information might be presented by

linking Web page 3 to Web page 4, but that might be too complex.) Having completed that portion of the tutorial on Web page 3, the student clicks on a link at the bottom of the page and goes back to the mainstream Web page.

A student chooses link 4 on Web page 2 and goes directly to Web page 4 (handgun safety rules). Having completed that portion of the tutorial on handgun safety, the student clicks on a link at the bottom of the page and goes back to the mainstream Web page.

All links eventually lead students back to the mainstream Web page. There are additional links in the mainstream Web page that take students further through the overall WBT presentation on ordnance safety.

A student who knows all there is to know about handgun safety would take neither link 1 nor link 2 on the mainstream Web page but rather would continue to travel through the mainstream WBT presentation to learn other ordance safety procedures.

Help

Software has built-in Help files that assist in using the program. Likewise, WBT presentations can include built-in Help Web pages that assist a student to easily use the WBT presentation. You can create them and link to them just the same as you create any other Web pages.

Unfortunately, when you think of Help, you think of the Help files in Windows programs. They are somewhat anemic and not much fun to use. Web browsers provide a similar Help system provided especially for Web presentations, but I've seldom seen it used. Why? Because it's so easy to create a Help system with Web pages that no separate system is needed.

Keep Help pages in mind. When you can add some Help pages in a crucial place to make things easier for your WBT students, do so. They will appreciate it. You can make creative and practical Web pages using the idea of Help pages.

And don't forget that you can add Web Help developed in-house to common software applications, thus enabling employees to get help as they work.

Voice

Voice is a great way to distinguish your WBT tutorial. Streaming sound works well on the Web, and if you can make a decent voice recording, you can put it on the Web. What are some of the things you can provide with voice in WBT?

- Short sound bites to enhance text content.
- Longer sound bites that form sections (full-fledged portions) of the content.
- Sound presentations (text free) that comprise the entirety of the content.
- Sound bites that create sidebars.
- Sound bites that provide Help for the WBT presentation or navigational assistance.
- Sound effects (not voice) that enhance the usability of the WBT. Includes short musical introductions and endings.
- Synthetic voice.
- Actual voice.

Short Sound Bites

You can create short sound bites with a minimum of effort that will provide a substantial and well-received enhancement of your WBT presentation (see Figure 12.5).

Figure 12.5 RealAudio in a Web page (with controls).

Audio Introduction

Starting all your WBT tutorial sections with a voice (instructor) is an elegant touch. The instructor has to add something of value to the text to make the sound worthwhile, but an introductory monologue that starts automatically as soon as the Web page is loaded has a lot of merit.

Unfortunately, this type of presentation doesn't work well the second time around. When you read something for the second time, you can easily skip or skim over the parts you remember and do not want to read again. With audio, the second time around, you have to wait until the audio portion runs its course. You can't skim it. This can be very annoying.

Hence, an automatic audio introduction works best for tutorials that you're sure people will read only once. However, if you can provide a simple, self-evident way to turn off the introductory sound bite, your use of an automatic audio introduction is more palatable.

Start with Music

A short introductory music sound bite enables students to adjust the sound volume before students come across the

instructional voice bites. But don't forget to tell them that's what the music is for, and you might even include instructions on how to adjust sound volume (for both Windows and Mac).

On Demand

The student clicks an icon (or text link) that starts the sound. Simple enough! This is strictly an election on the part of the user, and you have to give the user something of value. An exact reading of the text is not very meaningful. The sound should be used in a special way to add something extra to the text (e.g., a different slant on the content or an emphasis on a portion of the content), or it could simply provide additional information. For students, voice provides a refreshing change of pace from the text.

The HTML links for embedding a streaming media presentation in a Web page provide user controls (through attributes and parameters). These are necessary for you to enable students to control the streaming media.

Authority

Having a voice, especially the voice of an expert, can add authority to the text. For example, the voice (expert) can point out what the student should get out of the particular text block with which the sound bite is associated. The authoritative voice can establish credibility.

Long Sound Bites

Long sound bites can make up a significant portion of the presentation and replace what would otherwise have to be covered only by text or another medium.

On Demand

Normally long sound bites are on demand but have controls that enable a user to control the way the sound plays.

Dynamic Presentation

One of the best uses of voice is in a self-propelled presentation such as a slide show. You coordinate the various voice bites to play with each slide. The voice is often the primary language medium. Use SMIL, covered in Chapter 19, to create dynamic Web presentations.

Entire Sound Presentations

Just as you can have a WBT presentation entirely in text, you can have one entirely in sound. This is comparable to a training presentation on cassette tape. You can stream such a presentation over the Web or can even do the same on a CD where a Web presentation will also work well. Like text-only WBT presentations, however, sound-only WBT presentations seem a little thin and do not appeal to the majority of learning styles. Why not add other media and a little interactivity?

Sound in General

Some of the ideas that follow may prove handy as you plan your WBT presentations.

Two or More

More than one person in the sound bite engenders much more attention from users. One person can be the host, moderator, interviewer, or instructor while the other person can be a guest,

panelist, interviewee, or student. The human interaction and dialog creates more attention than a monologue. In other words, the presentation is less likely to be boring.

Indeed, if you can get a controversial exchange going, you can hold users' interest easily (assuming it's in good taste). Spirited interaction between people has a magnetic effect on listeners.

Archive

You can preserve a sound presentation in an archive. You might want to use sound bites from past live presentations that you have recorded. Your WBT presentation can use these archived sound bites as resources to augment its content.

Just an Alternative?

If you make your WBT presentation all voice sound, there's a danger that it will be just an alternative to a cassette tape or CD sound presentation. That is, it's like a book on tape. This may not be a good idea since most people listen to educational cassettes or CDs as they commute in their cars. Without wireless connections to the Web in their cars, most people will not use a sound-only WBT presentation.

Help

If your WBT presentation is to include Help, you can provide it in voice instead of text. Indeed, this works better than text in some cases, especially when the voice explains what is visually displayed on the screen.

Sound Effects and Music

Music is well beyond the scope of this book, but music certainly has a place in almost any presentation. If you use a little music, don't overdo it. Make sure that music enhances your presentation and does not disrupt it or steal the show. Some introductory music or some ending music can make a nice touch.

You can use sound effects to enhance your WBT tutorial. This gives it a professional touch if done with subtlety. A subtle sound resulting when one clicks on an icon or otherwise uses the WBT presentation gives useful feedback to students. (Gratuitous sound effects are invariably disruptive.)

For instance, you might use a short music bite or a sound effect to introduce voice audio sidebars. Whenever students hear the sound, they know they are beginning to listen to a sidebar and are no longer in the mainstream of the sound in the WBT presentation. A complementary sound when leaving the sidebar alerts users that they moving back into the mainstream of the sound. Of course, you need to alert students with voice when moving into or out of a sidebar. The sound effect is just a reinforcement.

How do you use such sound effects? It's easy with a digital audio editor such as Sound Forge (*http://www.sonicfoundry.com*). You just copy and paste portions of sound files into a sound bite just as you copy and paste word blocks into word processor documents. Read more about creating streaming sound in Chapter 17.

Voices

Record voices to use in your WBT presentations, even for short sound bites. This is always appropriate.

The alternative is to write text and have the computer read the text with a synthetic voice program. Such computer-generated

voices handle a variety of situations adroitly. For instance, that may be a reasonable way to use voice for Help. Using a synthetic voice for an essential portion of your WBT presentation, however, may be tedious. If you are compelled to do so, make sure you thoroughly test it on students as a pilot project before fully deploying it.

Video

Video has already been mentioned in Chapter 9 as a terrific medium but one that may not be cost-effective for WBT. Nonetheless, if you can produce it or otherwise obtain it, you can integrate it into your WBT presentation via streaming video.

The use of video clips parallels the use of sound bites. In fact, video clips have a sound track. Wherever you can use a sound bite, you may be able use a video clip effectively in its place. That gives you wide flexibility, if you can afford the expense. Moreover, there are things that video does better than any other medium (e.g., instructing how to play golf).

A video clip appears in a fairly small window on a computer monitor. Thus, like sound bites, it's easy to use video together with the relevant text that the video supports. Although you can make an entire WBT presentation with video clips, the current state of video capability does not support long video clips. The lack of quality makes watching for a long time a chore for students. Consequently, your WBT should always be a mixture of media that works best.

Embedded Programming

Naturally, a digital presentation can provide programming as well as presenting media. Consequently, you can actually embed small,

and even large, computer programs right in a Web page, and they make terrific enhancements of Web-based learning. Embedded programs can do anything that any computer program can do.

The most obvious use (to us) is to create calculators. Suppose your WBT tutorial teaches users how to calculate the value of an income property using the capitalization rate and the net operating income:

Value = Net Operating Income/Cap Rate

You can put a calculator right in the Web page. It will have inputs for net operating income and cap rate, and it will have a display for the resulting value. Users can experiment with it as much as they please trying different inputs.

How about a combination of calculations and graphics? Instead of calculating a number for the value, the embedded program could show the resultant value in a bar chart.

Placement

The convenience of embedded programs is that they are right there together with the relevant text. They are convenient. They do not necessarily have to be someplace separate like a physical calculator or a standalone program. Even if you don't put them right in the text, they never have to be more than one click away. As mentioned earlier, you might include in your WBT presentation a navigation menu with a dozen calculators always ready for a user to call up quickly with a click.

Dedicated

Embedded calculators or other programs are usually dedicated; that is, they are tailor-made for the task at hand. For instance, in the real estate value calculator above, the only calculation done is

simple division. It can be done on almost any calculator. When embedded into the Web page as a value calculator, however, the calculation to be made is not ostensibly a general division calculation but rather a specific value calculation.

Text-Enhanced Calculators

You can create text-enhanced embedded calculators. For instance, suppose you have three buttons on the calculator mentioned earlier. Click on one button and text pops up (in a Web window or in a separate Web page) to tell you how to enter the inputs: cap rate and net operating income. Click on the second button and text pops up with glossary definitions of value, cap rate, and net operating income. Click on the third button and text pops up with a more detailed explanation of the calculation. These all enhance the calculator and also presumably enhance the mainstream presentation.

Redundancy

There's no reason, of course, you cannot use *and reuse* an embedded program wherever you need it in a presentation. It doesn't necessarily have to be only in one place. Think of it as a reusable object that you can copy and paste anywhere in your presentation, and remember repetition is a key to learning.

Use

How do you use embedded calculators? You simply place a special HTML link in the page in the place where you want the calculator to appear. If the software developer provides the customizing capabilities, you can even use the attributes and parameters pro-

vided with the link to determine the size of the calculator (as it appears in the page) and its functionality.

The link for a calculator goes to a Java program (group of files) that you uploaded to the host Web server or to CGI scripts that you uploaded to a special folder (usually *cgi-bin*) on the host Web server. A calculator can also be JavaScript programming (lines of code) that goes right in the Web page.

Online Software

Go to ThinkFree (*http://www.thinkfree.com*), where you can use a word processor and a spreadsheet. They are Java applets downloaded into your computer for you to use free. They save files in Microsoft Word file format and Excel file format (even though they are not Microsoft products). You can save your files to the provider's hard disk (also a free service) where presumably they are backed up regularly and reside more safely than on your own hard disk. What a great service!

Online Software?

How does online software differ from embedded programming? It's simply standalone software not necessarily incorporated into a WBT presentation. Nonetheless, it can be used by students together with a WBT presentation.

You can do the same for your Web-based training. Probably you won't invent and program anything but simple software yourself, and most people will not do that much. Nonetheless, eventually there will be a wide variety of online software packages you can license for use with your WBT presentations. Via such software you can provide enhanced WBT to students where the use of such software is appropriate.

Java Applets

Many embedded programs will be written as Java applets. Embedded programs tend to be small, but they don't have to be. Applets can be large full-fledged programs with powerful capabilities. Applets can also be standalone online software with powerful capabilities.

Data

As mentioned in Chapter 9, consider data for the purpose of discussion the same as information. The convenient use of data offered by Web technology enables significant potential enhancements both on intranets and on the Internet.

Intranet

On your intranet, you can get access to your organization's databases, document archives, shared files, and other informational resources via the network. If you have training that can use such data or information, you can incorporate such access into your WBT presentation. If much of your organizational data is sensitive or confidential, you may have to obtain permission for students to access specific data if they don't already have authorized access.

Internet

The Internet is becoming the greatest data and information resource in the world and in the history of the world. (The one possible exception is the Library of Congress.)

Before the Internet, resources were always separate from education. They were in the local library, in the New York City library,

in a museum, in a corporate archive, in a government office or database, in a statistical aggregation, and the like. Now, many of those resources are just a click away. The significance is that such resources can now be integrated into WBT presentations. They don't have to be separate.

Thus, if you need to use the US Census statistics for something you teach, such statistics are close at hand in their entirety, whereas before it would have taken 50 physical volumes (or whatever number) to incorporate them into a training session. Yes, just a click away at the US Census Bureau website.

Just exploring this aspect of the potential for WBT deserves a book by itself. However, the potential resources to be used for various WBT presentations are as numerous as the trees in the forest. So, we will let you figure out what you need for your WBT. It is enough here to make the point that *primary resources* no longer have to be separate from education.

Rare Materials

Instructors often have rare, unique, historical, or unusual educational materials that they would like to share with students. Before the Web, such things were perhaps passed around the classroom, giving each student a brief look at them. If an instructor digitizes the images or recordings of such things, he or she can make such artifacts available in Web pages for each student to thoroughly review and study. This is a huge bonus for WBT. Don't overlook such materials you have in hand that you can now incorporate into your online training.

Dynamic Devices

What are dynamic devices? They are special Web programs that move Web media elements. They come in a variety of forms such as Dynamic HTML (DHTML), JavaScript, SMIL, Flash, Shockwave, CGI scripts, and Java. They are generally beyond the scope of this book, but you may find some ready-made dynamic applications, which you can use with ease and confidence. For instance, self-regulated slide-show devices are commonly available. You put in the text and the color photographs (and perhaps sound bites). A student clicks on a Web-page button, and a slide show starts running and continues until finished.

Dynamic devices can simply put on a show. A student is a spectator who views the presentation until it finishes. But you can also create more complex dynamic devices that include interactivity. For instance, you might use a bar chart to illustrate a principle of financial analysis. A student inputs numbers into a form. A calculator makes calculations using the numbers. Normally the results would be more numbers. However, you could employ a dynamic device that expresses the results as bar charts rather than numbers or a device that easily and instantly (with one click) converts the results from numbers to bar charts.

Dynamic devices are appealing because a student sees movement—a parade of slides or bars that go up and down with each new calculation—often a welcome relief from an otherwise static WBT presentation.

Indeed, it's difficult to imagine trying to teach certain things without a dynamic medium. For instance, a slide show to teach a student how to swing a golf club will work more effectively than individual photographs or text.

Video

Naturally, video is a dynamic medium but one that this section ignores, as it is covered earlier. But note that you can also use the video window itself as a media element and move it around the screen dynamically.

Dynamic HTML

With JavaScripts in a Web page, you can make multimedia elements move. The elements might be text strings or blocks, images, video windows, or even links. Generally, DHTML is beyond the scope of this book. However, certain Web authoring programs such as Macromedia Dreamweaver and Adobe Go Live enable nonprogrammers to easily and quickly create movement in Web pages. This can add a new dimension to your WBT presentations that would otherwise require a programmer.

Animation

We normally think of animation as Mickey Mouse. This is cell animation. Each cell is drawn separately and is like an individual frame in a moving picture. Animation doesn't have to be entertainment. It can also be animated drawings that teach a student the flow of tasks in a work process. For instance, it can show how to handle a loan application or how to pay an invoice. The problem with cell animation is that it requires labor-intensive development and is usually created by skilled specialists (i.e., artists). Thus, it tends to be expensive. Nonetheless, it can be an effective teaching device well worth the expense.

However, there is a simple type of digital animation available that you can create or that at least won't break your budget. That's

sprite animation. In sprite animation, normally only one element moves (i.e., the "sprite"). The sprite can be any media element but is normally an image. Animation programs make it easy for you to trace the path that the sprite will take just by moving your cursor around the screen (see Figure 12.6). Then when you save and play back the animation, the sprite moves along the path you traced .

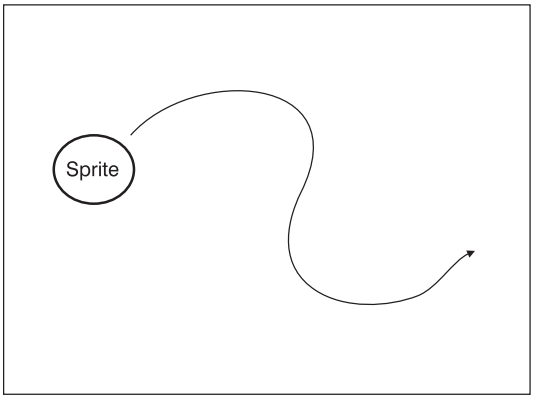


Figure 12.6 Diagram of sprite movement across a background.

Generally, the background stays the same in sprite animation. One small image (sprite) moves over the background image. For instance, in a work flow chart, an arrow might move from box to box (each box representing a separate process) through the work flow as the text explains each separate process. Anyone can create sprite animation with a Web animation program such as Flash, or a DHTML authoring program, and the requisite images.

Sprites?

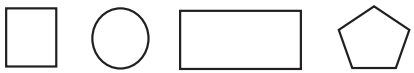
Sprites are static elements. The movement is not within the sprites themselves but rather is the movement of the sprites around the screen. You can use a plain background, although

more often you will use one image for the background over which the sprite travels.

Think of DHTML as sprite animation with multiple sprites, all moving, and you start to get the picture of how DHTML can be used.

Don't underestimate the value of sprite animation for educational purposes or your ability to create it using the appropriate authoring software. This is a terrific technique for teaching complex concepts. For instance, the animation mentioned earlier about teaching the work flow for handling a loan application could be created with cell animation. Yet you could also easily create it yourself as a sprite animation. The number of tasks required to take a loan application, authorize a loan, and close the loan transaction for many types of loans (e.g., real estate) can be very complex. An animated work flow illustration could be a compelling teaching device and one that you can create with the appropriate authoring software.

How can you create such a work flow animation? First, you create the artwork. In this case, you can create chart elements (e.g., boxes and circles with appropriate labels) using a program such as Adobe Illustrator.



Next you need to convert the files for such objects into image files that you can use in a Web page (e.g., GIFs). Then you can use a Web authoring program such as Dreamweaver that also enables sprite animation to create the work flow animation (see Figure 12.7).

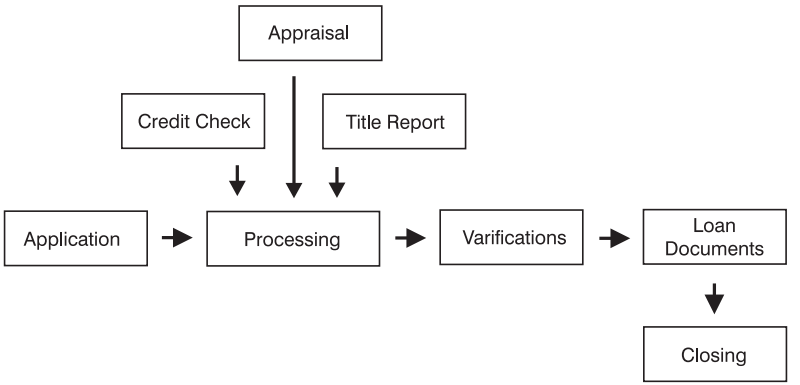


Figure 12.7 A loan work flow animation. Imagine boxes or arrows moving or changing color as a narrator explains the flow of processing a home loan.

Before doing this project, you might want to sketch on paper a rough version of what you expect to do. This will help you plan the project more effectively and reduce the amount of time and energy you need to devote to it. Instead of creating your own sterile Illustrator images, you might want to hire a digital artist to create more aesthetically pleasing images that you can use for the background and as sprites. This will give your work flow animation more appeal without the need to also employ the artist (who knows little about loan application work flow) to arrange the dynamic portion of the presentation.

All things considered, creating complex sprite animations or complex DHTML may not be the best use of your time in regard to WBT. But you can create simple animation projects quickly and easily with the right authoring tools. When you need them, create them. Your students will appreciate it.

Tedious?

Animation has its place as a valuable teaching aid. Never use

animation, however, for the sake of showing off. It must enhance the educational process, or it's not worth the trouble and expense. Animation is also similar to music. If it's forced on a student, it may work well the first time. But the student may have to access that portion of your WBT presentation a second, third, and fourth time; if the animation is not elective, it may become quickly tedious.

Summary

This is not a definitive chapter on types of WBT. It gives you some practical ideas to consider, and undoubtedly you will use some of the devices discussed. But there are dozens and dozens of types of WBT, and your job is to discover and use a few that suit your training purposes well. WBT can be more than posting black-and-white text pages on the Web. Using diverse media particularly well matched to the content you present has the potential of making your WBT more effective.

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V

Advanced Web Techniques

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13

Embedded Programming

Embedded programming enables a browser via the Web to handle any kind of computing. This means with the appropriate programming, you can do anything in a browser; you can deliver any type of computing via the Web.

This is a powerful idea, one that is just starting to be realized. Delivering robust computing capability via a browser is a new growth industry, which will accelerate in the years ahead. If there's something special you want to provide with your WBT pre-

sentation, you can do it—assuming the programming expense fits your budget.

What Can You Use?

Built into the Web is the Common Gateway Interface (CGI) enabling you to run programs for students on your Web server that appear to run in their browsers. Another means of furnishing programming is to provide Java applets. These are programs that download into a student's computer and run.

CGI

CGI programming (often called CGI scripts) runs on the Web server. A student triggers the operation of this software in his or her browser (e.g., by clicking on a button), and the software seems to run in the user's browser.

CGI scripts can be written in any programming language that will run on the server computer that hosts the Web server. However, since most CGI scripts are comparatively simple programming, Pearl scripting (a simple programming language) has become very popular for writing CGI scripts.

The primary disadvantage of CGI scripts is that they put a load on the server computer. One computer does the work for many. The server can run only so many CGI scripts concurrently before performance is affected. This is not an important consideration for low-traffic server computers. For high-traffic servers, however, it becomes a potential bottleneck.

Java

Wouldn't it be nice if you could transfer the computing to the client computer (student's computer) from the server computer? Then server computer performance wouldn't be a problem. Each computer would do its own computing.

The Java programming language does just that. Java applets don't run on the server computer. They download into a student's computer and run on that computer. When the student closes a Java applet or turns off his or her computer, the Java applet evaporates.

JavaScript

First, JavaScript has nothing to do with Java. It's a separate programming language more analogous to Pearl scripts than to Java. It's a simple scripting language, but it's still the realm of programmers. The JavaScript code goes right in an HTML document and runs on the user's computer, not the server computer. Although it does not offer the full functionality of a full-fledged programming language, you can do a lot with it.

In the Page

When placed in a Web page, a JavaScript is not compiled. That means anyone can read it, copy it, and use it. You may have copyright protection for it, but you have no copy protection for the exposed code.

Where?

When you run CGI scripts, you have to make arrangements with your Web host to install them in such a manner that they will run

as designed. These arrangements are routine. However, the Web host may be fussy about how the CGI scripts are programmed because the scripts run on the Web host computer using that computer's power. The Web host will want the scripts to be efficient and secure.

When you use Java, your Web host isn't part of the picture because the Java applets run on a student's computer. They download automatically and run. They use the computing power of the student's computer; the Web host computer isn't involved or affected once the download is complete.

If traffic becomes high, you might have to start using two or three server computers to provide enough computing power to run your CGI scripts for an entire organizational WBT offering (one course normally wouldn't generate enough traffic to cause an overload). However, for the same amount of traffic the server computer would handle Java programming and JavaScript without a need to add additional computers.

What Can It Do?

Embedded programming can do almost anything you want it to do. It provides vigorous computing power to users (i.e., students). Conveniently, you place the software right in the Web page and make it part of your WBT presentation. You can, in effect, integrate it with the text and other media. A Web program doesn't have to be a standalone device identical to the other programs you use every day. It really can be integrated into the Web page.

Real Estate Calculator

In a series of Web pages, a variety of commercial real estate analysis calculations are presented. Each is a mini tutorial. They all

refer to a common example, Maplewood Apartments, presented on yet another Web page.

Take a look at the following Java applet, which calculates the underwriting analysis for a commercial real estate loan (see Figure 13.1).

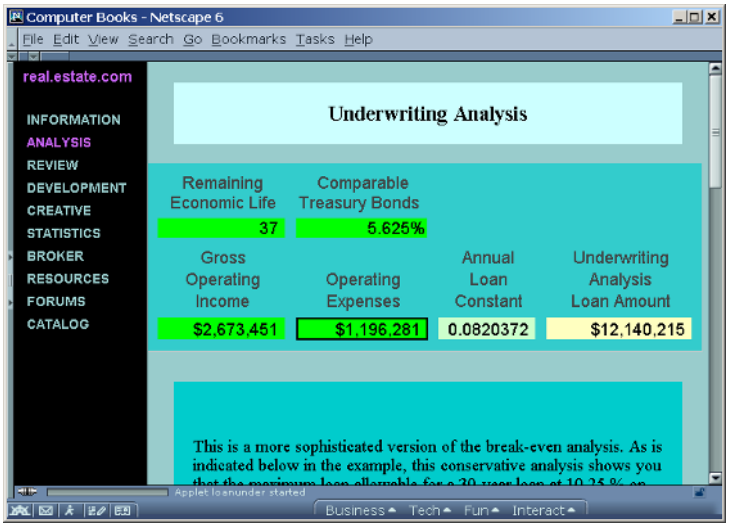

Figure 13.1 Underwriting analysis calculator (upper portion of Web page).

Below the calculator, it explains how to determine what the inputs should be (see Figure 13.2). Note that it also refers to the extrinsic example, Maplewood Apartments, which is essentially a financial analysis of an income property. The financial data in the separate example (Maplewood Apartments) enables students to use its data to make practice calculations.

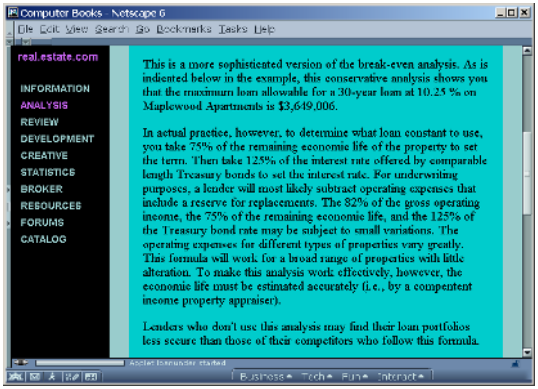
Computer Books - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
real.estate.com
INFORMATION
ANALYSIS
REVIEW
DEVELOPMENT
CREATIVE
STATISTICS
BROKER
RESOURCES
FORUMS
CATALOG
This is a more sophisticated version of the break-even analysis. As is indicated below in the example, this conservative analysis shows you that the maximum loan allowable for a 30-year loan at 10.25 % on Maplewood Apartments is $3,649,006.
In actual practice, however, to determine what loan constant to use, you take 75% of the remaining economic life of the property to set the term. Then take 125% of the interest rate offered by comparable length Treasury bonds to set the interest rate. For underwriting purposes, a lender will most likely subtract operating expenses that include a reserve for replacements. The 82% of the gross operating income, the 75% of the remaining economic life, and the 125% of the Treasury bond rate may be subject to small variations. The operating expenses for different types of properties vary greatly. This formula will work for a broad range of properties with little alteration. To make this analysis work effectively, however, the economic life must be estimated accurately (i.e., by a competent income property appraiser).
Lenders who don't use this analysis may find their loan portfolios less secure than those of their competitors who follow this formula.
Business Tech Fun Interact

Figure 13.2 Explanation for using inputs for the underwriting analysis calculator (mid-portion of Web page).

The mini tutorial also provides the formula for the underwriting analysis for those who desire to understand it better and perhaps integrate it into their own calculations (see Figure 13.3). It also includes the formula to calculate the loan constant, which is needed for calculating the underwriting analysis.

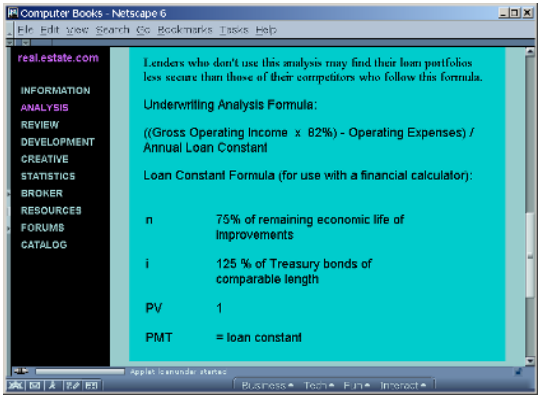
Computer Books - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
real.estate.com
INFORMATION
ANALYSIS
REVIEW
DEVELOPMENT
CREATIVE
STATISTICS
BROKER
RESOURCES
FORUMS
CATALOG
Lenders who don't use this analysis may find their loan portfolios less secure than those of their competitors who follow this formula.
Underwriting Analysis Formula:
((Gross Operating Income x 82%) - Operating Expenses) / Annual Loan Constant
Loan Constant Formula (for use with a financial calculator):
n 75% of remaining economic life of improvements
i 125 % of Treasury bonds of comparable length
PV 1
PMT = loan constant
Business Tech Fun Interact

Figure 13.3 Formula for the underwriting analysis together with the formula for the loan constant.

Finally, a review of the actual calculations for the extrinsic example, Maplewood Apartments, are given (see Figure 13.4). This concrete example will be helpful to those who have become familiar with it. The words "Maplewood Apartments" is a convenient link to the Web page that presents the example for those who want to refresh their recollection of it.

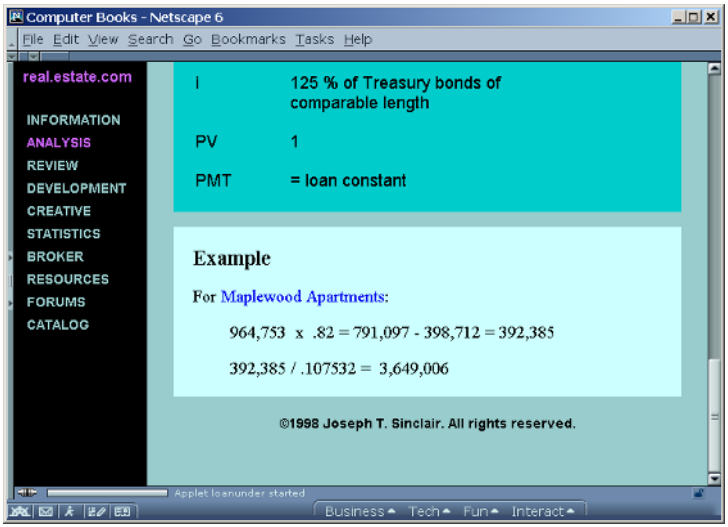

Figure 13.4 The calculations for the example Maplewood Apartments are provided.

Keep in mind that these are all on one short Web page (see Figure 13.5). Although this example is stylized, you can also bury a simple calculator inside a text block (paragraph) where it becomes an inconspicuous teaching device. This works best where only one or two inputs are required, and such inputs don't have to be explained.

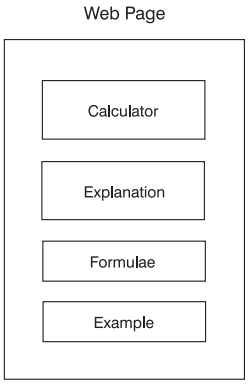

Figure 13.5 Diagram of the Underwriting Analysis Web page.

Notice that the calculator calculates, but it also helps you make the correct inputs and explains how the calculation works. It's at once a calculating device and a teaching device.

Not by a Programmer

The Java applet calculator was created using a Web spreadsheet authoring program, which automatically converts Excel spreadsheet applications into Java applets. You do not have to be a programmer to use it. Unfortunately, this particular program is no longer available.

Garden Planner

Another example was on the garden.com website, a garden supply catalog now defunct. It featured a landscape planner Java applet. You took plant, flower, shrub, and tree icons and moved them around on a grid to plan your garden (see Figure 13.6).

Figure 13.6 LandscapePlanner on the old garden.com website.

After you finished planning, if you chose, the software automatically ordered everything you had used in your plan and shipped it to you. (Note that garden.com now takes you to the Burpee website.)

This wasn't a lightweight calculator. It was a full-fledged program that compared to standalone software that you might buy in a computer store. It was a heavy-duty application programmed as a Java applet.

Perfect Device

By the way, wouldn't LandacapePlanner have made a perfect learning device for a WBT course on landscaping? You bet it would!

This applet was, of course, custom programmed for this website. If you had wanted to use it for your WBT landscaping training, you would have had to develop your own at considerable expense. Or, perhaps, you could have licensed this one and saved a considerable amount of money.

Web Page Devices

Devices such as actions caused by mouse-overs and clicks are popular and convenient and can add some pizzazz to your WBT presentation while providing necessary and convenient functions (e.g., a drop-down menu which appears upon a mouse-over).

Mouse-Overs and Clicks

When you pass the cursor over a predesignated area (e.g., an icon), it can trigger an action. This is called a mouse-over. You can also place the cursor on a word or icon and click a mouse button to trigger an action. This is called a *click* or a *mouse click*.

Wherever possible, however, use JavaScript to create such devices rather than Java because JavaScript is likely to require much less download time.

Four Sources

Where do you get programming that you can embed in Web pages? There are at least four general sources: ISPs, shareware and freeware, custom programming, and custom authoring. Which you pick depends on what you need.

ISPs

ISPs provide Web host service to those who do not run a Web server themselves and are not part of an organization that runs a Web server. Many ISPs provide a library of CGI scripts for various uses. You simply pick one and install it in the proper place in

your Web host file tree (usually *cgi-bin*). Then reference the script in a Web page. Shazam! It works—a user can use the program.

The scripts an ISP offers are limited and usually have to do with various generic aspects of operating a website.

Shareware and Freeware

You can check shareware listings for Java applets and JavaScript that you may be able to use for a WBT presentation. Shareware is inexpensive. Freeware, which turns up in shareware listings, is free. Unfortunately, the chances of finding anything useful are not great. Nonetheless, it's worth a look. Try CNET (*http://cnet.com*) under downloads.

Programmers

The entire world's selection of shareware and freeware will never come close to covering all the software that may be needed in a WBT presentation. Most likely, you will have to subcontract with a Pearl, Java, or JavaScript programmer to create your own CGI scripts, Java applets, or JavaScript. The cost will depend on what you want to do. It can be very inexpensive or very expensive. A simple calculator might be only peanuts. A garden planner will probably cost a few bucks. Before you decide programming is too expensive for your WBT project, get an estimate from a programmer.

Don't pay a programmer to duplicate in CGI scripts or Java what the Web can do already. It pays to be familiar with HTML and other Web technologies just so you can avoid duplicating Web functionality via subcontracted programming. Likewise, don't attempt to recreate existing software (e.g., word processor) via your

subcontracted programmer. Instead, whenever practical, license such software you need for your students.

Authoring Software

You will find most authoring programs for Pearl and Java too difficult to use if you're not a programmer, because most were designed for programmers. However, a few were developed for nonprogrammers, and you might find them useful. Be skeptical of such programs until you're convinced you can use them productively.

Disadvantages

The trouble with using embedded programs is that it puts you in the software development business unless you just license the online software of others. Consequently, you have to test and revise adequately to make sure you provide a dependable product. For simple programs, this is not a big issue. But the more complex the programming, the more you will have to act like a seasoned software developer.

Well-written CGI scripts should work well. Badly written CGI scripts may work OK for students but use server computer resources inefficiently. This can lead to an overworked server before its time.

Java is a new programming language. Initially unstable, it has matured since it was introduced in 1995, but it can still be unstable and lead to instability in students' browsers and even students' operating systems. This is particularly true when you embed multiple Java programs in one Web page. It pays to be cautious and test adequately when employing Java.

JavaScript code goes right in the Web page. Like HTML, you cannot keep your work secret. Whatever you invent and create can be easily used by others.

Case Study

A book by one of the authors, *Real Numbers* by Joseph T. Sinclair, makes a good case study for embedded programming. For over 300 pages the book teaches real estate investment analysis. That's a lot of analysis, a lot of calculations. If you decided to turn that book into an enhanced digital product (e.g., WBT), what would you do? Here are some choices:

- Add some links to other relevant sources of information on the Web.
- Add some color photographs of buildings in which one might invest.
- Add some sound bites by the author to enhance text passages.
- Add some video clips featuring the author lecturing or that show buildings.
- Embed some calculators into the text.

What's your choice? The fact is that all of the above would add some pizzazz to the book. But because the book features dozens of calculations, the embedded calculator idea stands out for this particular book. Most of the other ideas are embellishments. The embedded calculator idea is especially appropriate for this book and *does what no printed version of the book can do*. Indeed, the capability to embed calculators in this book (and in other books like it) is a very exciting idea and one that shows the great potential of Web publishing and WBT.

In the Calculator section earlier in this chapter, an embedded calculator is featured as a standalone mini tutorial (underwriting analysis). Were that same calculator to be embedded in a digital version of *Real Numbers*, it might take on a different appearance and would undoubtedly be better integrated into the text. Moreover, if desired, the embedded calculator could even be reduced in size to the point where it was almost lost inside a text block and thus very unobtrusive.

Such tight integration into the text might be desirable for some purposes. For other purposes, a larger, more obvious presence for the calculator might be more desirable.

Pop-Up Window

Instead of using a separate Web page for a sidebar, you can use a pop-up window. This is actually a separate Web page but one that appears in a separate browser window. This requires JavaScript. The JavaScript follows:

```
<SCRIPT LANGUAGE="JavaScript"><!--
Begin


function Start(page) {


OpenWin = this.open(page,
"CtrlWindow",
"toolbar=no,menubar=no,width=500,heig
ht=360,left=150,top=150,scrollbars=ye
s,resizable=yes");


}
```

```
// End --></SCRIPT>
```

This goes in the <*head*> of the Web page. It requires the complementary special URL, which goes in the <*body*>. The URL is:

```
<a
href="javascript:Start('sidebar_c2_2b
.html')";>[sidebar button]</a>
```

The URL is for the sidebar Web page named *sidebar_c2_2b.html*. When a student clicks on the sidebar button, a window 520 x 400 pixels pops up with the sidebar Web page in it (see Figure 13.7).

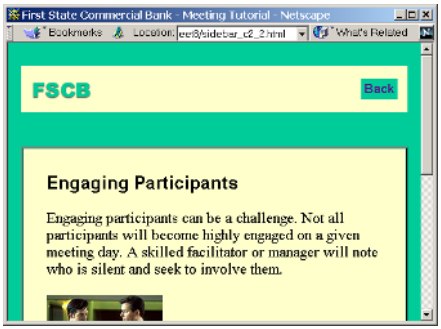
First State Commercial Bank - Meeting Tutorial - Netscape
Bookmarks
Location:
What's Related
FSCB
Back
Engaging Participants
Engaging participants can be a challenge. Not all participants will become highly engaged on a given meeting day. A skilled facilitator or manager will note who is silent and seek to involve them.

Figure 13.7 Pop-up window for sidebar.

In the sidebar, you need to give students a link to close the sidebar. They can close the sidebar window by clicking on the X in the upper right-hand corner of the window, but many may not know that. So, you have to provide a link for closing that requires another JavaScript. In this case, the JavaScript is in the link, not the <*head*>. It is expressed as follows:

```
<a href="#"
onClick="window.close()">Close</a>
```

When a student clicks on this link, the sidebar window closes (see Figure 13.8).

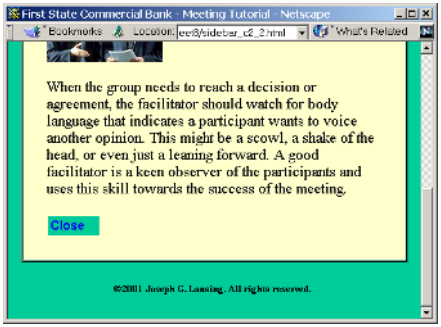
First State Commercial Bank - Meeting Tutorial - Netscape
Bookmarks
Location: ee8/sidebar_c2_2.html
What's Related
When the group needs to reach a decision or agreement, the facilitator should watch for body language that indicates a participant wants to voice another opinion. This might be a scowl, a shake of the head, or even just a leaning forward. A good facilitator is a keen observer of the participants and uses this skill towards the success of the meeting.
Close
©2001 Joseph G. Lansing. All rights reserved.

Figure 13.8 Link for closing sidebar window is in lower left-hand corner.

This makes a practical example of what you can do with a little scripting. And JavaScripts that make the mundane devices augmenting Web page functionality are readily available at various places on the Web. However, keep in mind that if you run across functions in Web pages that you want to use (published by others), look at the page source. If the functions are created by JavaScripts, you can save the Web page and copy and use such JavaScripts for your own Web pages, unless such JavaScripts have a copyright notice.

Page Source

To see the page source (HTML) of a Web page via the Netscape browser, go *View, Page Source*. To see the page source of a Web page via the Microsoft browser, go *View, Source*.

This example is in the Meetings tutorial (on the CD) where you can use it to view the source.

Summary

Embedded programming is used quite a bit for Web functionality such as pull-down menus on mouse-over. There are also a lot of cool programs, cute but essentially useless (dancing digital doodads).

The real story, that you don't hear a lot about, is that embedded programs can add to content, such as financial calculators embedded in financial presentations. Clearly, this idea is fabulous for WBT.

When you need an embedded program for your WBT presentation, you can create it several ways (via a programmer) or perhaps even find a suitable program (script or applet) available to you via shareware or freeware.

Experiment with embedded programming. It has much potential for WBT and will eventually become a routine technique for teaching students via the Web.

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14

Forms

HTML provides you with the capability to receive input from your students via Web pages. You use the HTML forms device. Students fill in the form, and the input is automatically accumulated for you. This can make WBT a uniquely interactive medium; that is, it enables a direct and convenient communication by a student to an instructor without the use of other Internet protocols.

What For?

Why do you want input from students and what can you use forms for? The answer is, the same old stuff: the same data and information you need for any training. A few ideas follow:

- Course registration
- Customer service
- eCommerce
- Student surveys
- Course critiques
- Student feedback
- Quizzes and exams
- Student questions
- Submittal of information
- Email

A course registration form makes registration convenient for students. Customer service is always important in any endeavor. If you are collecting a fee for the WBT, you can offer the convenience of paying over the Web. You will need to use a form to initiate a transaction unless you use e-commerce software.

You can do student surveys before and during the WBT. After the WBT, you can ask for student critiques. You do so with forms. You can also provide forms throughout your WBT to get immediate student feedback.

Forms also provide you with a way to test students. Give an exam via Web page forms. However, questions don't always have to be directed to students. Via forms you can provide students the immediate capability of sending questions to the instructor.

Something to keep in mind is that there is no constraining limit to the amount of text students can submit via forms. Thus, you can request and receive from students almost any amount of information via text input.

Finally, you can put a form for email right in the Web page as a convenience to students. But don't stop here. Surely, you can dream up plenty of more uses for forms in your WBT.

All in all, forms provide you with a powerful means of administering and conducting a WBT presentation as well as communicating with students.

Alternative to Forms

Unfortunately, forms aren't always the most convenient means for students to use for communication. Email may be more comfortable, particularly for longer communications. Use the *mailto:* link when appropriate in place of a form.

How They Work

The HTML forms markups enable you to collect input several different ways. In lieu of using HTML, you can use a Web page authoring program such as Microsoft FrontPage Express to build forms.

Once you have created the forms, a student enters the appropriate data into the inputs in a form. Then the student clicks on a button usually labeled *Submit*. The browser transmits the data (inputs) to a server or an email address (i.e., the instructor's email address).

If sent to a server, the server passes the data along to an application (CGI script; see Chapter 13). The application can simply

accumulate the data (in a file where the instructor can get it) or process the data for further use by the instructor.

An application can also interact with the form in such a way as to make sure the inputs are complete and correct. This kind of interaction is not enabled by HTML and is beyond the scope of this book. If you need the forms to be filled out precisely, you might consider hiring a programmer to engineer an application that forces students to fill in the inputs completely and correctly and informs them when they don't. Some generic CGI scripts also do this (see CGI Script Form Resources later in this chapter).

The Form

What follows are illustrations of the various means of entering input. You have some flexibility in what you can do.

HTML

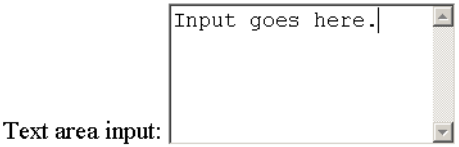
See the Forms section of Appendix II for the HTML markups of the various inputs covered in this section.

One-Line Text

This entry is great for one word or a group of words not exceeding one line. You can even put several of these inputs on one line.

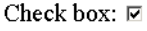
Text

When the input needs to be more than one line of text, you can use the *textarea* markup.



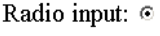
Checkbox

When the input requires more than one of several choices, you can use the checkbox markup.



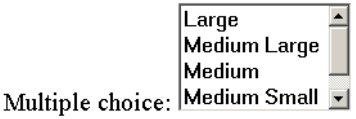
Radio

When the input requires only one of several choices, you can use the radio markup.



Multiple Choice Menu

When you want to require only one choice of several on a menu, you can use the multiple choice markup.



Buttons

Finally, no input in any form will ever get to you unless a student submits it. You must provide a *Submit* button. A student has to click on the *Submit* button to send the input out of a form to you.

Submit button: Submit

You can also provide a *Reset* button, which will erase all the entries out of a form so that a student can start over. The student clicks on the Reset button to use it.

Reset button: Reset

Composer

Composer doesn't offer forms authoring. Author your forms in a plain text editor using HTML or in an HTML editor. Then copy and paste into your Composer page. A more convenient means for some people will be to use the HTML Source mode of Composer to code the forms. See Appendix II for a Forms section in the HTML tutorial.

FrontPage Express

FrontPage Express does provide forms authoring capability, and you can put forms in a Web page easily.

It's as easy as placing the cursor where you want the form and clicking on an icon on the forms toolbar to create a form (see Figure 14.1).

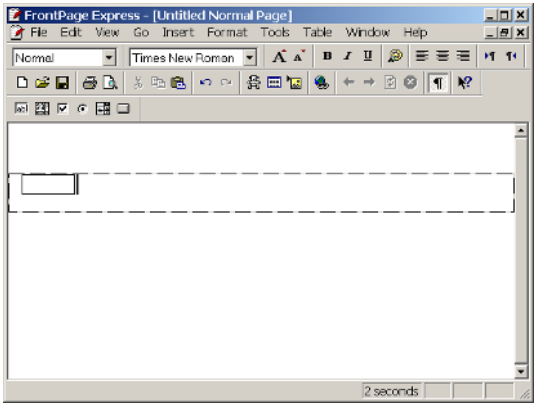

FrontPage Express - [Untitled Normal Page]
File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
2 seconds

Figure 14.1 Creating a one-line text form in FrontPage Express.

Notice that there is a dashed line around the one-line entry window. That indicates the extent of the form. If you want to add a checkbox to the form, you must place the cursor inside the dashed line and click on the checkbox icon. The checkbox will appear inside the form (see Figure 14.2).

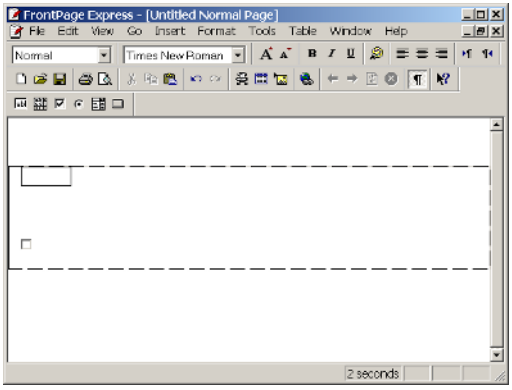

FrontPage Express - [Untitled Normal Page]
File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
2 seconds

Figure 14.2 Checkbox added inside the form becomes part of the form.

If you add the checkbox outside the dashed line, it will create a second form (see Figure 14.3).

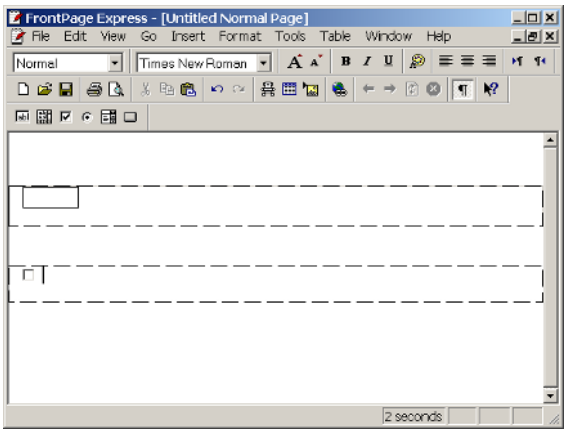

FrontPage Express - [Untitled Normal Page]
File Edit View Go Insert Format Tools Table Window Help
Normal
Times New Roman
2 seconds

Figure 14.3 Checkbox added outside the form creates second form.

Creating forms with FrontPage Express is easy, but you may have to tune up such forms with HTML coding to get them just right.

CGI Script Form Resources

There are freeware, shareware, and commercial CGI scripts for forms available on the Web. A variety are available from the following URLs:

BigNoseBird.com (*http://bignosebird.com*)

DCScripts (*http://www.dcscripts.com*)

Dream Catchers Web (*http://dreamcatchersweb.com/scripts*)

FreeScripts.com (*http://www.freescripts.com*)

Independent Solution (*http://www.supercgis.com*)

Perl Studio (*http://www.perl-studio.com*)

Scripts by Tammie's Husband (*http://www.conservatives.net/atheist/scripts/index.html*)

Shakke CGI Scripting (*http://www.kilohana.com/dev*)

Web Ware Index (*http://www.webwareindex.com*)

This is not a complete list, but it will get you off to a good start, and you will be able to find something among these resources to handle general HTML forms. The alternative is to hire a programmer to write custom scripts for you. Try these resources before you decide you need to hire a programmer.

Fancy Scripts

Some of the CGI scripts available on the Web have built-in capability to ascertain that the forms are filled out precisely as well as the further capability to inform students when an input in not filled out correctly.

The Delivery

A form must encompass all the inputs inside it. The destination you put into the form tells the form where to send the information gathered by the form to you. You can have more than one form in a Web page.

Mail To

Generally, it is not a good idea to put a form in a Web page for email. The alternative will be handier for students. Simply put in a link with *mailto: [email address]* as the SRC.

```
<a src="mailto: jt@sinclair.com">Send
an email.</a>
```

When a student clicks on the link, the student's email client will pop up ready to send a message with the addressee already in place. The student can write the email message as he or she normally would.

Application

A special application can deliver the data gathered by the form wherever you choose and put it in whatever format you choose. For instance, suppose your Web page form gathered the following information:

First name

Last name

City

State

The application could place each bit of data into its own column in a database table.

FnameLnameCityState

JohnZinctopperBostonMA

Or, the application could place each bit of data into a business card format in an address book.

John Zinctopper

Boston, MA

This application might be part of a larger program, or it could be one that you hired a programmer to write.

It's always better to use an application to handle the information gathered by forms. The application can put such information in a format that you can use easily.

Summary

Forms are great for receiving input in a Web page. The input can be emailed to you, acquired in a file for you, or put in a database for you. Sophisticated application (scripts) can even put the input in a form easy for you to use.

Forms together with email help make WBT a two-way communication avenue. This is important particularly in WBT presentations that have an instructor. Forms enable instructors with a convenient and easy-to-use means of receiving input from students, and students also find forms convenient and easy-to-use.

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15

Readable Text

Text is a great medium—if it's readable. The essence of text is its readability, a notion so obvious that it's almost silly to state, except that so many websites ignore it. Chapter 5 gets you off to a good start with readability. Indeed, HTML provides fully functional typesetting and layout even if we have to tweak it a bit sometimes to make it look professional. But HTML does not offer the fine grain typography one finds in the world of print. For that you

need to look to Cascading Style Sheets (CSS), which give you almost complete control over typesetting and layout.

General Guidelines

The general guidelines for WBT typography are the same as for any digital typography. Readability remains the primary concern. It's an important issue because a computer monitor is a low-resolution device. Any little thing that can be done to improve reading becomes very important to do.

Color and Background

Text must always be over a clear background. A tiled-image background almost always makes reading difficult no matter how faint the image is. Just say no to background images.

A white background is harsh on students' eyes. Although it's true that if one turns down the brightness on one's monitor, reading on a white background can be comfortable. Unfortunately, you have no control over students' brightness settings. Therefore, you need to resort to other means of providing a readable background.

Using a color other than white helps reading comfort. The color should be culturally pleasing and light enough to support high contrast to the color of the type. Thus, pastel background colors, or grey, with black type make good combinations. Using grey is, in effect, almost identical to turning down the contrast on a monitor.

Author's Choice

One of the authors uses a medium green background color with black type. He can read or write for long hours without eyestrain. However, medium background colors aren't for

everyone. Light background colors are a better choice for most WBT presentations.

Other combinations are not only possible but often used by Web developers. Light-colored type (but not white type) on a dark or black background promotes readability. Monochrome monitors with yellow or green type on a black background became very popular before color monitors and were very readable. The original monitors (circa 1979) featured white on black but were soon replaced by green or yellow on black. Many elegant websites use a black background with light-colored type, and WebTV uses a black background exclusively.

We're not suggesting that you use a black background necessarily, but it's a viable choice for readability when it's otherwise desirable. For the most part, stick with a light-colored background and black type. Naturally, you will want to use browser-safe colors so that you can be sure every student sees the same colors.

Type Size

What type size to use poses a significant question. Certainly, anything smaller than 12 points impairs readability. For smaller type, most students will have to lean closer to the screen to read it. For 12-point type, most people can read comfortably from their normal viewing position, which is likely to be their working position. But when reading for pleasure or reading long columns of text, many students might be inclined to relax and lean back in their seats, thus putting more distance between their eyes and their monitors. This situation calls for larger type in the 14- to 16-point range.

Consequently, normal text for WBT presentations should be set in 12- to 16-point type depending on how your students will use it.

But note that this is not an isolated factor. Different type sizes require different column widths.

Text Columns

Text needs to be in columns that are 9–11 words wide. Wider or narrower columns will reduce readability. For 12-point type, 480–520 pixels is the correct width. This fits neatly inside all Web browsers including WebTV, which is smaller than even the smallest computer monitor resolution (see Figure 15.1).

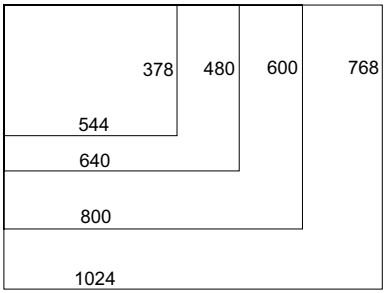

Figure 15.1 Standard screen sizes in pixels (smallest is WebTV).

This means that a column 480–520 pixels wide will promote maximum readability for 12-point type, allow students to read from their normal body position (eye distance from the monitor), and fit inside all browsers. Make reading easy for your students; make it a practice to display your text this way.

Typefaces

Alas, you can count on students having only the standard fonts covered by Chapter 5. Although it's true they may be very likely to

have other typefaces installed in their operating systems, you can't count on it.

If you could use any typeface you wanted to, you would be fussy about what you used. Some typefaces display on a monitor much better than others; that is, they are much more readable. So, presumably you would choose such typefaces. But with normal Web technology, you're stuck with the few typefaces you can count on.

On the Intranet

If you distribute your WBT presentation only on your intranet, then you can use any typefaces that you know for sure that all of the employees have.

For the hardy WBT developers, however, there are three special Web typography technologies that will improve readability. Each is a little different.

TrueDoc

Bitstream's TrueDoc enables you to embed any fonts in a Web page. The fonts, in effect, travel with the Web page. A student does not have to have such fonts installed in his or her operating system. This technology works in Netscape browsers. It also works in Microsoft browsers with the one-time automatic installation of a special Active X device. You use the <*font*> markup to put the fonts in Web pages, and you use a special authoring tool to create the special copies of the fonts to go with the Web pages. For more information on this clever system, visit the Bitstream TrueDoc website (*http://www.truedoc.com*). See Figure 15.2. Both Bitstream and third-party vendors make TrueDoc authoring software.

This technology works well and has the potential for creating readable and attractive WBT presentations. However, you will have to

choose your fonts carefully to make it work well. Read *Typography on the Web* (Sinclair, AP Professional, 1999) for more details.

Font Embedding

Microsoft has a technology comparable to TrueDoc, which it simply calls font embedding. However, it's not as good (readable) as TrueDoc and works only in Microsoft browsers. Microsoft gives away the authoring tool (WEFT) you need to embed fonts in the Web pages. You can find more information on font embedding on the Microsoft website in the typography section

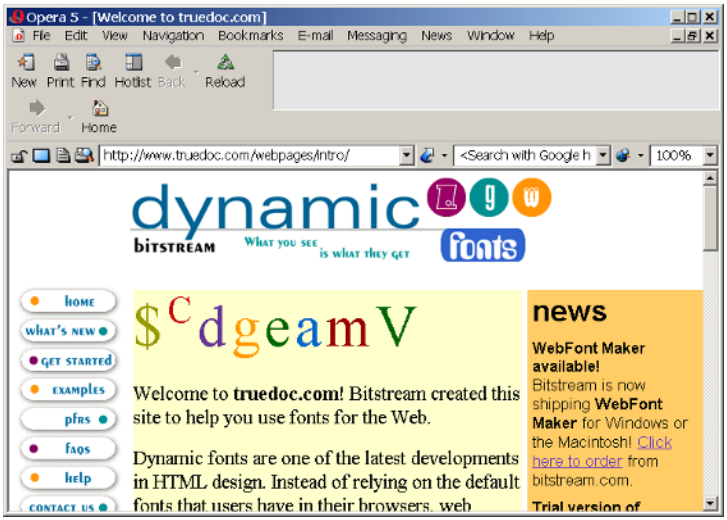
Opera 5 - [Welcome to truedoc.com]
File Edit View Navigation Bookmarks E-mail Messaging News Window Help
New Print Find Hotlist Back Reload
Forward Home
http://www.truedoc.com/webpages/intro/
<Search with Google h
100%
dynamic
bitstream
What you see is what they get
fonts
home
what's new
get started
examples
pfrs
faqs
help
contact us
$CdgeamV
Welcome to truedoc.com! Bitstream created this site to help you use fonts for the Web.
Dynamic fonts are one of the latest developments in HTML design. Instead of relying on the default fonts that users have in their browsers, web
news
WebFont Maker available!
Bitstream is now shipping WebFont Maker for Windows or the Macintosh! Click here to order from bitstream.com.
Trial version of

Figure 15.2 TrueDoc website.

eBooks

Microsoft has a technology for making fonts sharper with software it calls ClearType. Competitors such as Adobe have similar resolution-enhancing technologies. These font enhancements work espe-

cially well on active matrix LCD monitors (high-end flat panel monitors). They don't work nearly as well on normal (cathode ray tube—CRT) monitors, although they still show some improvement. These technologies, however are not being integrated into operating systems where they belong. Instead, for business reasons, you'll find them only in ebook readers. They do improve the resolution significantly but only for ebooks.

How does this relate to WBT presentations? First, you will have to put your text into one of the ebook readers such as the ones offered by Microsoft and Adobe. Second, although students with CRT monitors will get some benefit, those with active matrix LCD monitors will get the most benefit. The ebook readers run well on a normal computer as well as on an ebook reader hardware device, and the readers are free from both Microsoft and Adobe.

The Microsoft Reader enables four typefaces, including Georgia, a sharp serif screen font. The Adobe eBook Reader enables whatever typefaces a Portable Document File (PDF) uses: virtually all digital fonts. Thus, for Adobe, you can use whatever fonts you find to be most readable on a screen. This capability of using a variety of enhanced resolution fonts without such fonts having to be installed in a student's operating system is a major feature of ebooks.

Should you use ebooks in your WBT presentation? Sure. It requires an ebook reader in addition to a Web browser, but a student can use both at the same time. The ebooks are especially appropriate to use where your students can benefit from the extra readability of the ClearType (i.e., if they have active matrix LCD monitors). For long reading passages, ebooks make sense to use, and it can be easy, quick, and inexpensive to convert text into ebooks, small or large.

At such a time that ClearType or similar technologies are integrated into operating systems as they should be, students will be able to use ClearType with Web pages.

eBook Readers

There is some confusion regarding ebook readers. Ironically, most physical (hardware) ebook readers have low-quality LCD screens and cannot make maximum use of ClearType and similar resolution-enhancement technologies. Software ebook readers run on both hardware ebook readers and on normal computers. Probably the best portable device for a portable ebook reader is a laptop computer with an active matrix LCD screen and a software ebook reader installed.

All things considered, TrueDoc is probably your best bet for enhancing the reading experience of students, at least until everyone uses ebooks on active matrix LCD screens.

Brief CSS Tutorial

This tutorial on CSS is short and incomplete. It's a mere introduction to show you that it's not a foreboding art. A nonprogrammer can master it easily and quickly. In any event, there's not that much to master if you use a CSS editing device which comes with many Web authoring programs or HTML editing programs.

Composer and FrontPage Express

The two free Web authoring programs don't have everything. Specifically, they don't have CSS editing devices. But many Web authoring programs and HTML editing programs contain easy-to-use CSS editing devices.

CSS is another language like HTML. It's plain (ASCII) text. Every browser has a built-in style sheet, which is applied to all Web pages. The CSS style sheet replaces—as much as possible—the browser's style sheet. In other words, with CSS you substitute your idea of style for that of Netscape or Microsoft. See Figure 15.3 for an illustration of how it works.

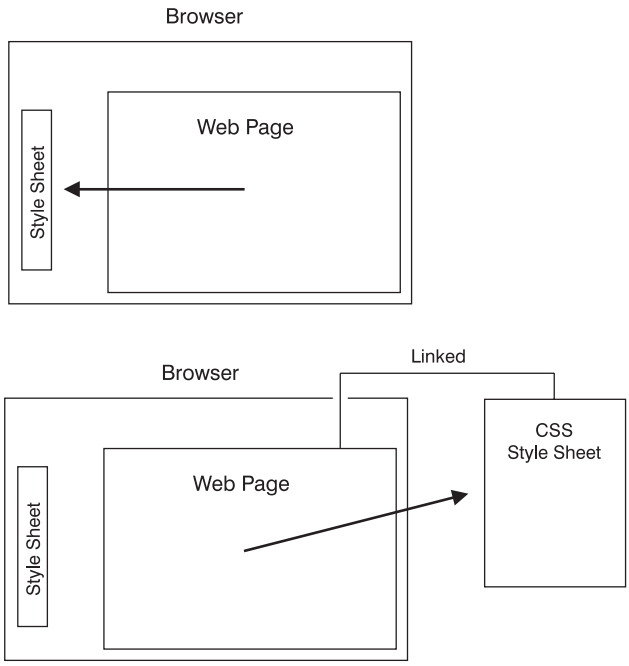

Figure 15.3 Browser style and CSS style.

CSS encompasses the following properties:

Font

font-family

font-style

font-variant

font-weight

font-size

font

Text

word-spacing

letter-spacing

text-decoration

vertical-align

text-transform

text-align

Color and Background

color

background-color

background-image

background-repeat

background-attachment

background-position

background

Classification

display

white-space

list-style-type

list-style-image

list-style-position

list-style

text-indent

line-height

Layout

margin-top (right, bottom, left)

margin

padding-top (right, bottom, left)

padding

border-top-width (right, bottom, left)

border-width

border-color

border-style

border-top (right, bottom, left)

border

width

height

float

clear

You start with an HTML markup such as <*p*> for paragraph. You assign <*p*> some properties. The markup goes outside and the properties go inside the CSS brackets:

```
p { font-family: Georgia }
```

This assigns the typeface Georgia to the <*p*> markup.

```
h1,h2,h3 { font-family: Arial }
```

This assigns the typeface Arial to the top three levels of Web page headings.

```
p { margin-left: 100px }
```

This assigns a left-hand margin 100 pixels wide to the <*p*> markup.

You can also create and define new classes. For instance, you might create a class *indent*, which indents the first line of text in a paragraph. You start a class with a period.

```
.indent { text-indent: 40px }
```

This class will indent the text of any markup you use it with.

<*p.indent*>

This will create paragraphs with an indent on the first line of 40 pixels.

As you can see, CSS is not terribly complicated, and it provides you with the opportunity to create, in effect, a typography markup language of your own with as much precision as you want.

A CSS style sheet does not have to define every markup. For instance, the following is a complete CSS style sheet.

```
<!-- Small Booklet style sheet. Use
for reports and small booklets. Do not
use for articles or editorials. -->

p { font-family: Georgia; margin-left:
100px }
```

It would be a complete style sheet without the commentary too. In this case, the style sheet defines the <*p*> markup, and the browser continues to define the style for the other markups.

CSS is a Web standard and works in the Netscape and Microsoft 4.0 browsers and higher. CSS2, an advanced version of CSS, even contains pagination capability. That means that you can control

the length of a page printed from a browser and even include running heads and foots. This gives you complete control over even the printing from a browser. Look for pagination to be implemented by Netscape and Microsoft in their latest browsers.

Where?

Where does the style sheet go? It can be in a separate ASCII file, in the Web page, or even inside a markup in a Web page (one style instruction). A separate file will serve many Web pages. A markup in the head of a Web page links the Web page to its style sheet file.

Keep in mind that with a style sheet, you create your typesetting system for the Web. You certainly don't want to do this individually for every Web page you create. Therefore, you will be inclined to use the same style sheets over and over again just as you use the same templates for a word processor over and over again. The fact that one style sheet file can serve many Web pages is quite convenient.

Cascading?

What does cascading mean? Think about an external style sheet, a style sheet in the head of a document, and a style sheet inside a markup in the text. Which one controls (if there is a conflict)? Under CSS, these style sheets are said to *cascade* according to CSS rules to determine the controlling style. This happen only in the case of a conflict in styles, and in most situations the most local style will control (i.e., the style sheet inside a markup; contains one style instruction).

Readability

The rules of readability are not a secret. Publishers have spent untold sums to refine and improve typography for printing over the last 500 years. Most printed books and magazines are easily readable. Why then are so many Web pages virtually unreadable?

Simply, Web developers create Web pages. These tend to be technically oriented people or digital technicians who place little value on refined arts such as typography. They don't know the rules and don't follow the rules. In many cases, they produce Web pages and websites where the text is almost unreadable or at best is uncomfortable to read. Consequently, it is generally acknowledged that one cannot or will not read on a computer monitor.

Yet many people read on computer monitors all day to do their work. And the work of many people includes reading or writing long letters, reports, briefs, white papers, maintenance manuals, etc., on computer monitors of all qualities. To be sure, some of these workers are printing text on their computer printers before reading it, but to say that people cannot or will not read on a computer monitor just doesn't make sense.

What does make sense is for Web developers, and more specifically WBT developers, to use all the means at their disposal to improve Web typesetting in every possible way. As mentioned before, with low-resolution hardware, every little improvement counts. The sum result can be readable text on the Web. If you provide text for your students, make sure it's readable.

Summary

Text must be readable. Sounds like a self-evident statement. Yet so much of the text you see on the Web is not very readable. Don't

make the mistake of ignoring your text quality as a WBT developer. Use all the tools you have for improving the readability of Web-page text, and you'll be surprised how much you can do.

Colored backgrounds, columns, appropriate typefaces and type size, fine-tuned typesetting and layout via CSS, and even embedded fonts all help to make your students' reading less painful and more productive.

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16

Complementary Technologies

There are a variety of established and emerging technologies that can assist you in developing WBT. As a useful explanation of all such technologies is beyond the scope of this book, we will present just a few of the most useful for WBT developers.

All of these technologies warrant their own books. Most do have one or more books that can further your technical education. This chapter will give you an introduction to help you explore the WBT possibilities with each technology covered.

Training Templates

There is a type of WBT development software that isn't easily categorized. It is more than simple Web page authoring software yet less than a full multimedia development package. This development software generates WBT content for deployment on the Web or on an organization's intranet. It is usually limited to the use of text, graphics, and client-side programming (runs on client computers) such as Java or JavaScript. You can create fast effective WBT presentations but not a multimedia extravaganza.

The secret behind these packages is their extensive use of templates. These programs come with examples of training elements such as tutorials, tests, and quizzes ready for a WBT developer to fill with their specific content.

Coursebuilder

Macromedia produces a WBT development product under the name Coursebuilder (previously known as Attain Objects). It is a an extension application for Dreamweaver (see Chapter 20) and cannot run without it. Owners of Dreamweaver can download the Coursebuilder extensions from the Macromedia website (see Figure 16.1).

Coursebuilder includes JavaScript libraries to make several types of learning tools work in regular Web pages. The associated JavaScript libraries are uploaded to the final website for the WBT presentation. There they interact with the Javascript that Coursebuilder inserts into the Web page to make learning tools such as exercises and tests perform correctly.

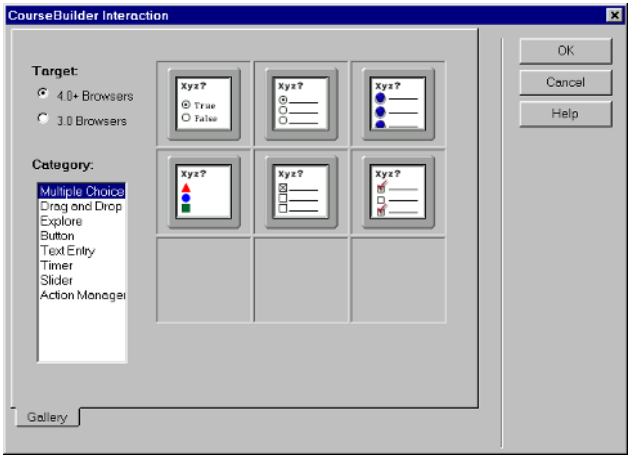

Figure 16.1 Course Builder for Dreamweaver.

No JavaScript programming skills are necessary to use Coursebuilder. Through the use of point and click interfaces, a WBT developer can create a variety of useful learning exercises and tests. Multiple choice and fill-in-the-blank questions are quick to build. A little more time and effort can result in graphic drag and drop exercises for more visual student exercises.

Basic skills for using Dreamweaver are required to get started with Coursebuilder. While Dreamweaver and Coursebuilder are not development tools for beginners, it doesn't take experienced Web developers long to gain basic proficiencies.

Net Synergy

Mentergy (*http://mentergy.com*) produces a WBT developers product called Net Synergy. While Net Synergy is intended for use in their suite of WBT developer tools, it still serves as a suitable standalone WBT developer's tool. WBT developers in need of

instructional design assistance can use Mentergy's Designers Edge to create WBT storyboards. These storyboards are then exported to Net Synergy for conversion to WBT presentations.

Like many of these tools, Net Synergy uses templates to help WBT developers. Examples of training exercises are included as HTML templates. Net Synergy handles more complex interactivity through the use of Java applets. These can be customized with the developer's specific content.

Multimedia-Based Software

Diverse media can provide powerful aids to learning. The hallmark of WBT that goes beyond the norm is usually the use of media besides text and graphics.

Shockwave

Shockwave content is powerful multimedia that can include graphics, text, sound, animation, and video. Shockwave content is created using Macromedia Director 8 Shockwave Studio, and finished products are called Shockwave movies. Web users need the Shockwave Player plug-in in order to view Shockwave movies. The player is pre-installed in the MacOS 8.1+ and the Windows 98/Me operating systems. Some 167 million Shockwave Players have been distributed (as of September 2000), resulting in roughly 55 percent of Web users being able to view Shockwave movies. Web users can get the free Shockwave player from the Macromedia website (*http://www.macromedia.com*). Shockwave has a server component in addition to the player. The server component is called Shockwave Multiuser Server and needs to be installed on any host computer that needs to deliver Shockwave content with multiple user capabilities. Multiple user capability is necessary for

chat, broadcast presentations, or multi-user games and simulations.

One feature that makes Shockwave a powerful multimedia tool is its embedded programming, or scripting language. Macromedia calls this scripting language Lingo. Use of Lingo provides a developer ultimate control over the media components of the Shockwave movie. The possibilities for WBT presentations are limitless once the scripting language is mastered. Video or audio can be triggered to start at just the right time for the Web user, or hints can be made to appear if the user hesitates.

Shockwave content can change boring WBT presentations into exciting productions that students rave about. The downside to this technology is that learning to develop Shockwave content can be a long and demanding process. Large WBT projects with dedicated teams of developers are best suited to the creation of Shockwave content. Careful assessment of resources should be undertaken before an organization determines that Shockwave content is necessary for a WBT project.

Flash

Macromedia Flash is software used to create Web interfaces, graphics, games and puzzles, and other complex animations. It creates these by using a combination of vector-based graphics and embedded programming. Macromedia calls these creations Flash movies whether they are a Web interface or a simple graphic. Everything created in Flash is a Flash movie.

Web users need the Flash Player plug-in in order to view Flash movies. The Flash Player is free and widely distributed. Macromedia has made strong efforts to get the Flash Player bundled with operating systems and browsers. The Flash Player is pre-installed in Windows 98/Me, MacOS 8.1+, Netscape 4+, AOL 4+, WebTV,

RealPlayer, and Internet Explorer 5.5. This results in over 311 million or roughly 96 percent of Web users having Flash capability. If Web users do not have the Flash Player installed, they can simply browse to the Macromedia website and download a copy for installation.

Flash movies are client-side technology. When the browser requests a Flash movie, it is downloaded to the student's computer for viewing. Any embedded programming runs from within the movie, and there is limited or no communication between the Flash movie and any software running on the Web server. This presents some limitations, but Flash is still an excellent tool for WBT developers. See Figure 16.2 for Flash authoring.

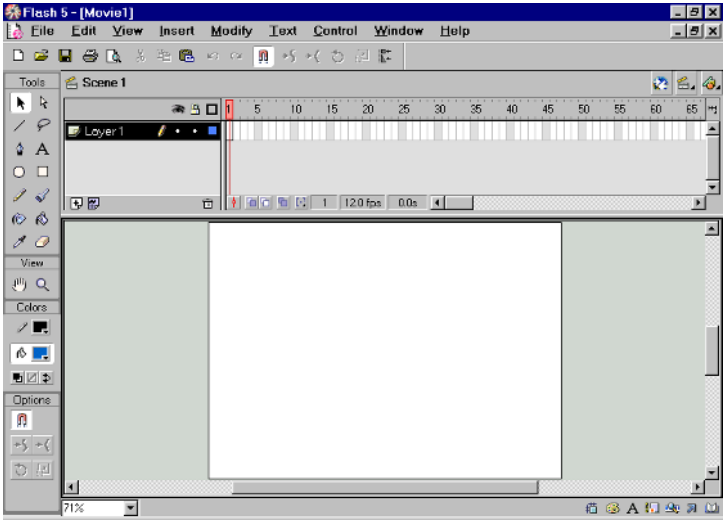

Figure 16.2 Flash authoring.

Flash is used in WBT presentations to enhance interactivity. Complex ideas or concepts can be illustrated through the excellent animation capabilities in Flash. The embedded programming, called Action Script, allows for the creation of complex interactions like

answer scoring and question branching. Action Script is capable of exchanging data with a learning management system to record student data such as names and test scores. Still, Flash movies are not capable of multi-user functions.

The learning curve for Flash can be quite steep. While simple animations can be created after a few hours of learning, more complex projects require dedicated expertise. There is an ample body of freelance Flash designers available for hire. A quick search of the Web will turn up many designers looking for contract work.

RealNetworks

RealNetworks (*http://www.realnetworks.com*) provides streaming media for the Web. It uses primarily Web standards, which it helped developed, and is the leader in Web streaming technology with 200 million RealPlayers currently in use (as of July 2001). It provides the RealPlayer free together with other free players for more specialized purposes. The RealPlayer plays RealMedia files through a Web browser (see Figure 16.3).

Figure 16.3 RealPlayer will play streaming media or will act as the engine to play streaming media in a Web browser.

RealNetworks also sells authoring software RealProducer, one version of which is free. You use the authoring software to encode (compress) media files into RealMedia files that stream. RealNetworks makes most of its revenue selling RealServer, a streaming media server that streams RealMedia better than a Web server (see Figure 16.4).

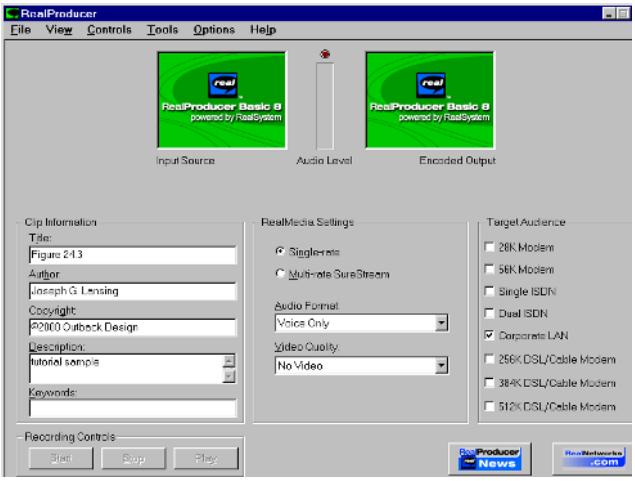

Figure 16.4 RealProducer, the RealNetworks media encoder.

Over a thousand radio stations broadcast over the Web via RealMedia. Many television stations post video archives in RealMedia files. The RealPlayer will play many proprietary streaming media files in addition to RealMedia files.

The capability of adding streaming sound and video to Web pages presents a great opportunity for WBT. See Chapters 17 and 18 for more information on how to use this streaming media software.

QuickTime

QuickTime is Apple's answer to RealMedia (see Figure 16.5). Although it's similar to RealMedia and competes with RealMedia, it's a proprietary system that works a little differently. It has a market penetration of about 100 million free QuickTime players in use.

Figure 16.5 Quicktime Player.

Microsoft Media Player

This is a system similar to RealMedia, complete with the free Media Player and free authoring software. It's Microsoft's second attempt to muscle RealMedia out of the picture, the first being NetShow. Due to Microsoft's enormous marketing power, you can expect Media Player to become a streaming media contender sooner or later.

Figure 16.6 Media Player.

Text-Based Software

Acrobat

Adobe Acrobat is paper replication technology. By taking a paper document file such as a word processor file (e.g., Microsoft Word) or a page layout file (e.g., Adobe PageMaker) and converting it to a Portable Document File (PDF), one can read it or print it with the free Adobe Acrobat Reader. The software for doing the conversion is built into various programs, or one can use Adobe's Acrobat (about $250), which converts a wide variety of document files.

The problem with Acrobat is that it focuses on paper. The Acrobat Reader is inept for reading on the screen, but it does a great job of printing a document via a computer printer. PDFs, in fact, have

become something of a standard in the print industry. (Create digitally on PageMaker; convert to PDF; make plates from PDFs; and print.)

Why then is it relevant to WBT? If for no other reason, because it brings sophisticated printing capability to WBT. After all, you can attach an Acrobat file to an email message and send it to anyone easily; and email is an essential element of WBT even though it's a different Internet protocol. Acrobat Reader will also display PDFs in Web browsers (see Figure 16.7).

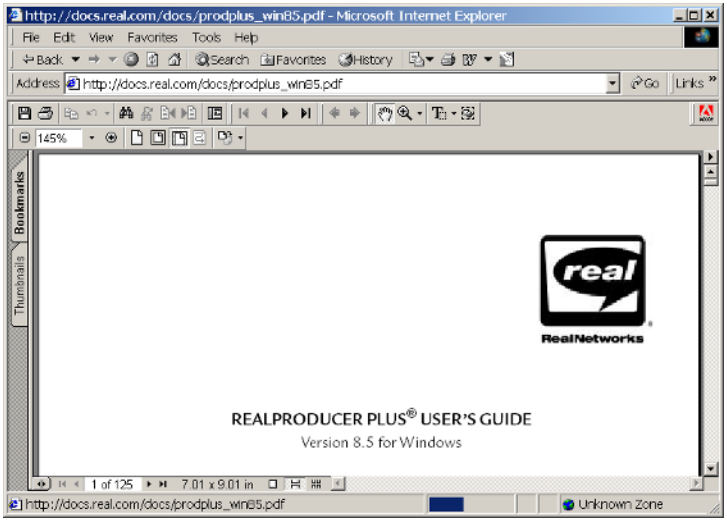

Figure 16.7 PDF in a Web browser (RealProducer Plus User Guide).

With the free Adobe Web browser plug-in and the free Adobe Reader, one can view Acrobat files in a browser directly downloaded from the Web (i.e., from a website) or print them. This capability makes it additionally valuable for WBT. Indeed, it is unfortunate that the Adobe Reader is such a poor screen reader, unlike its close cousin the Adobe eBook Reader.

You can use Acrobat when you want students to print documents before reading but still distribute the documents via the Web. Some students will elect to view the documents on the screen rather than print them, thus saving money. So, you may want to publish such documents using a font that reads well on the screen. However, Acrobat is a handy way to distribute documents that someone else originates, and you have no control over the fonts used for such documents.

How do you use this technology? Buy Adobe Acrobat, and convert digital documents. The resultant file is a PDF. It's quite simple. Many Adobe page layout software products such as PageMaker, InDesign, and FrameMaker come with Acrobat, and you don't need to buy anything more to create PDFs.

To embed a PDF in a Web page use the link markup. The following is the markup for a report entitled *Ranch* in a PDF file.

```
<a href:"pubs/ranch.pdf">Download
report (129K).</a>
```

This is a link that when clicked will automatically download the PDF into a student's Web browser (assuming the Acrobat plug-in is installed in the browser and the Acrobat reader is installed in the student's computer).

eBooks

The current form of ebooks was introduced in late 2000 when Microsoft annonced its Reader and Adobe announced its Acrobat eBook Reader (formerly Glassbook). Both run on computers (see the Microsoft Reader in Figure 16.8) as well as on ebook reader hardware devices. Both are free software.

Figure 16.8 Microsoft Reader.

Although Adobe's reader has better features, both are similar and have other competition too. They make viable platforms for presenting text and even graphics. Although ebooks have feeble capabilities now, the next generation of ebook readers will have more robust capabilities and will start to close the gap between ebook capabilities and Web document capabilities.

Do ebooks provide possibilities for WBT training? Certainly. Are they a Web medium? No. They're not a Web medium in the sense that they do not use the Web protocol. However, since you can easily attach an ebook to an email message and deliver it, they are a Web medium appropriate for WBT in the sense that email is relevant to WBT. Moreover, as explained in Chapter 15, they can

provide more readable text on certain devices (e.g., active matrix LCD screens) than can the Web at present.

A Web eBook Reader

Just as the Acrobat Reader has a Web browser plug-in for reading Acrobat files inside a Web browser, there's no reason the Acrobat eBook Reader or the Microsoft Reader can't have Web browser plug-ins. But they don't currently.

Capabilities

Exactly what can the ebooks do? The Open eBook (OEB) standard is similar to a basic HTML but not as robust. It is primarily limited to text and images. The Microsoft Reader uses OEB. The Adobe eBook Reader, however, uses a proprietary system that converts specially prepared Acrobat files into eBook files. Consequently, the typography capabilities are limited for the Microsoft Reader and robust for the Adobe eBook Reader. Still, the Adobe eBook Reader doesn't go much beyond text and images.

A student with an ebook reader can turn pages, highlight text, make annotations, and change the size of the type. It all sounds great, but in the end, the ebooks can't do as much as the Web in regard to presenting text products well and certainly cannot handle multimedia-enhanced text.

Why do ebooks exist? They attempt to give publishers control over their intellectual property with security schemes, something that the Web does not do. And they play a role in ultra profitable business schemes for Microsoft, Adobe, and others. That's unfortunate because certain features such as ClearType should be incorporated into operating systems, not ebook software. One can argue that the ebook software runs well on dedicated ebook reader hard-

ware. But so does the Web, and the leading ebook reader hardware enables Web browsing too.

Reader Hardware

The capability has existed for several years to create a reader for under $200 with an active matrix LCD screen (flat panel) that provides very sharp text. So far, no manufacturer has risked the production of such a device. Nonetheless, the market seems to be heating up, and such a device may appear at any time. When it does, the combination of high resolution text, ebook software, and Web browsing capability will create a publishing revolution and be quite useful for WBT too.

Development

How do you develop ebooks? You use authoring programs. ReaderWorks (*http://www.readerworks.com*) offers a free converter, which converts ASCII text files or HTML files into Microsoft Reader files (OEB files). It's easy to use and works well. For a fee you can purchase ReaderWorks' more capable converter. Thus, if you have text in ASCII or HTML, you can convert it into an ebook. Other conversion filters are under development.

For the Adobe eBook Reader, you simply make a Portable Document File (PDF) to certain specifications. There are dozens of programs that offer the capability to make PDFs. The Adobe eBook Reader views the special PDF file. Thus, if you can create a PDF, you can make an ebook.

Services

There are services such as Galaxy Library (*http://www.galaxylibrary*) that will take your text and convert it into a wide variety of digital text formats and make them available via the Web. This is a

painless way to provide reports and books for your students without worrying about forcing students to use a specific standard.

Size

A printed book is large. Print publishers generally don't publish books with less than 200 pages. Consequently, an ebook is large, right? Not necessarily! You can convert a 10-page report into an ebook just as easily as you can convert a 300-page book (see Figure 16.9).

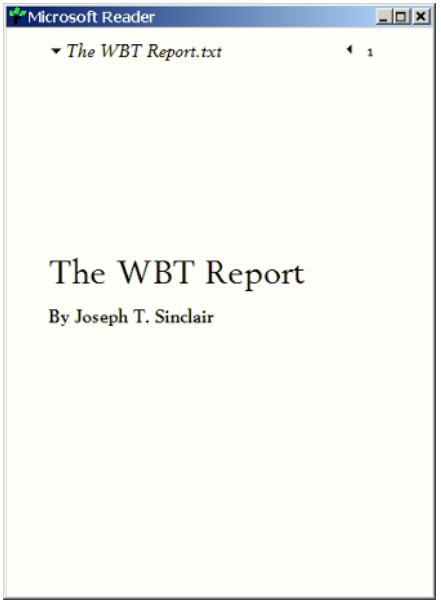

Figure 16.9 Report in ebook form.

Size doesn't matter. Indeed, ebooks make an elegant wrapper for all forms of text from essays to novels. Naturally, the smaller ebooks are quicker to download.

Legacy Databases

Many companies have legacy (old) databases, which few employees can access. Employees simply don't have the proper hardware or software to do so. Yet employees need access. The Web can become the common means of access to the data. By building a Web-database application that accesses all of an organization's databases, new and old, each employee can have easy access to the data (which he or she is authorized to access) via a Web browser. Building such a Web data access system is normally a major enterprise project.

Naturally, if you have created a WBT presentation that requires access to the organization's data, access via a Web browser is preferable over access by some other means.

Web-Database Applications

Web-database applications work by using Web page templates and filling them in with data (information) from a database. The Web pages do not exist until requested by a student's browser. In response, the Web-database application creates the Web page on the fly and delivers it to the browser. The Web-database application consists of a Web server, a database (usually on a database server), and software that controls the coordination of the two. The controlling software is sometimes known as middleware, because it is between the student and the database. An ODBC (Open DataBase Conectivity) connection connects databases to other programs (see Figure 16.10).

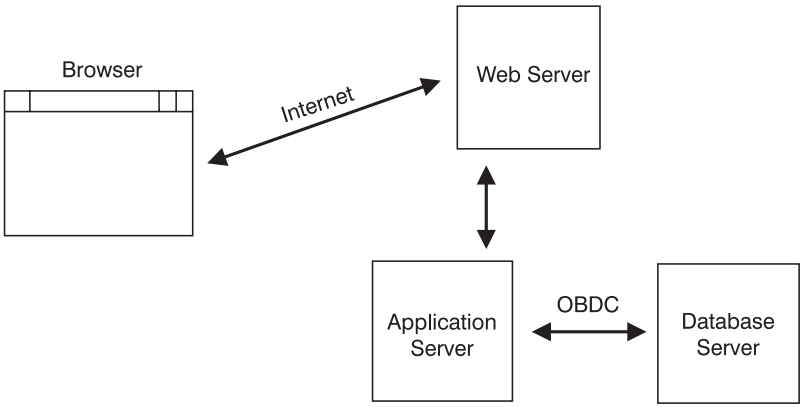

Figure 16.10 The application server is middleware.

Templates for Everything

The key to using Web-database applications is using templates. The aim is to have as few templates as possible (for efficiency) while having a unique template for each unique Web page.

Where's the Content?

If you have a WBT presentation with a considerable amount of information, such information is normally stored in Web pages. In a Web-database system, the information is stored in the database. Such information is poured into Web Page templates as requested.

Suppose you have three levels of students: beginners, intermediates, and advanced. Once you have identified which is requesting the information, you can provide a special version just for that student. Perhaps you will use one template. If a beginner requests the Web page, the Web-database application pours beginning information into the Web page template and delivers it. If an interme-

diate requests the Web page, the Web-database application pours intermediate information into the Web page template and delivers it. Finally, if an advanced student requests the Web page, the Web-database application pours advanced information into the Web page template and delivers it.

This approach to building a WBT presentation provides efficiencies. If you want to change the Web page color treatment and trimmings, you do it only to one Web page (the template), not to many Web pages. If you want to change the content of a Web page, you can do so on a word processor and then copy and paste it into the database. Efficiency, however, may not be the primary reason for using Web-database technology.

Data Accumulation

The real advantage of a Web-database system for WBT is the capability to accumulate and store (in the database) information about a student. Suppose that a student answers a question, which asks the level of his or her expertise. Depending on whether that expertise is beginning, intermediate, or advanced, the proper Web page is delivered.

If the student's name is in the database, the text in a Web page can be personally addressed to the student.

> John, after you pour the cream into the pan, take the pan off the stove immediately and start serving. This shrimp dish will cool down quickly, and you need to…

Statistical data can be accumulated on how a student uses a WBT presentation. With that data, the remainder of the presentation can be presented in a customized way.

You can ask a student to fill out a survey to accumulate information on him or her. With that survey, you can present a customized version of the WBT. The possibilities are endless.

Web-database applications for WBT can be simple, and simple to construct, or they can be complex, and difficult to construct. Their unique quality is the capability to react to information about students.

Summary

As your WBT development skills grow, you will want to learn one or more of these technologies to enhance your WBT presentations. Although it would be nice to be an expert in everything we covered in this chapter, that's probably not practical. When the time comes to advance your skills, select a technology that will best serve your WBT development needs. If you have experience with databases, start there. If you are artistic, then learn more about the graphics tools you can employ. If you like to use audio or video, learn about streaming media. These technologies enable you to break out of the text and graphics that comprises most WBT today.

VI

Advanced WBT Techniques

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17

Streaming Sound

There's great potential for using streaming sound with other Web media. What can you use? Music can play an important role in learning, and certainly you can use recorded music. However, although this book covers digitizing any type of recorded sound including recorded music, it does not cover recording music and then digitizing it. Moreover, this book gives priority to producing voice as streaming sound and covers both recording and digitizing

for voice. With this approach in mind, the following steps cover voice production:

1. Recording voice
2. Digitizing the recording
3. Editing and enhancing the recording with software
4. Encoding (compressing) the recording into streaming media
5. Embedding the recording in a Web page for use by students

Streaming sound is one of the most underused media on the Web because it seems complicated. Although sound production has many details, none of them are complicated. If you master them one by one, you will find producing voice as simple as anything you do on the Web. With some simple skills and a minimal amount of inexpensive recording equipment, you can make professional quality recordings appropriate for WBT.

Beware, however, that streaming sound can potentially turn your WBT presentation into a cassette tape or CD recording by presenting sound and nothing else. This is seldom desirable except for presenting or archiving a lecture or panel discussion.

Production

Production covers from recording voice to embedding streaming sound bites in Web pages. There are many details, but essentially it's a straightforward process.

The Goal

The goal of recording voice is to make a recording with a strong signal and with no distracting noise or distortion. It's easy to make a recording with a strong signal. It takes much care to make a

recording without distracting noises. Much of the information that follows is intended to assist you to make noise-free recordings without having to hire an audio engineer and record in a studio.

Equipment

For voice production, you can get by with some inexpensive recording equipment since most recording equipment today is high quality. The biggest problem is matching each piece of equipment to the remaining pieces of equipment (e.g., matching connectors).

Lines

There are two types of audio lines: special low voltage microphone lines and normal lines of higher voltage. Mixers, recorders, and sound cards (in computers) have both microphone inputs and line (higher voltage) inputs. All have line outputs.

Connectors and Cables

Various pieces of equipment must be connected. The objective is to use shielded cables just long enough to do the job with the proper connectors at each end. Don't try to save money buying cheap cables. There's nothing worse than a $5 cable that turns out to be the cause of a little noise that you spend ten hours trying to get rid of. If you don't spend $15 on each cable, you may be making a mistake.

Make sure your connectors on the cables match your equipment (see Figure 17.1). Perhaps another way of saying this is make sure the connectors on your various pieces of equipment match each other. For instance, there are low impedance microphones (expensive) and high impedance microphones (inexpensive); they gener-

ally use different and incompatible connectors (XLR for low impedance and one-quarter inch jack for high impedance).

Figure 17.1 Connectors: XLR, one-quarter-inch jack, minijack (one-eighth inch), and converters.

Don't use connection adapters. They convert one type of connector into another. These may be convenient and may save money, but they may also cause noise. Buy cables in the first place with the proper connectors at each end.

Most audio equipment is analog and requires normal analog cables. However, some equipment is digital and requires special digital coax cables. Some equipment even uses fiber-optic cables (e.g., Sony) that are incompatible with almost everything else.

Cables and connectors are enough to drive you nuts. If you can get this part of the equipment assemblage right, the rest of the production will be easy. For a wide selection of custom cables and connectors, try Markertek (*http://markertek.com*) or Full Compass (*http://www.fullcompass.com*).

Microphones

Microphones come in a wide variety of capabilities and prices ($10 to $7,000). Generally, recorders under $300 use high impedance (i.e., over 600 ohms) microphones under $75. They normally use one-eighth-inch minijacks. For recorders over $300, you may be able to use low impedance microphones. They use three-pin XLR connectors. Spend at least $35 for a high-impedance microphone. High-quality, low-impedance microphones start at about $100, and quality seems to go hand in hand with price (see Figure 17.2). Use low impedance microphones and XLR cables if you have a choice.

Figure 17.2 Shure high-quality, low-impedance microphone.

When you use one microphone for each person speaking, as you should, you use unidirectional microphones. When you record multiple persons with one microphone (not a great idea), you use an omnidirectional microphone.

Built-in Microphones

Never use built-in microphones. They pick up too much noise

from the recorder. Always use appropriate external microphones.

Mixers

When you record with more than one microphone, you need a mixer ($50 to $500). Even for recording with one microphone, it's convenient to use a mixer. With a simple mixer you can adjust the volume. This is very handy. With a more complex mixer, you can make additional adjustments. The mixer takes the signals from the individual microphones and mixes them so the sound quality does not deteriorate (see Figure 17.3).

Figure 17.3 Small Behringer 4-line mixer.

Recorders

Even some inexpensive analog cassette recorders ($70 to $200) have adequate quality to record voice professionally today. Special analog cassette recorders for voice are not terribly expensive ($250 to $600) and work very well. But you don't need a digital recorder;

use your computer instead. Buy a good sound card (e.g., Soundblaster Live!) and record directly to your hard disk. The most important thing to keep in mind is to match the connectors on your sound card to your other equipment.

Examples

We recommend three examples of recording systems, two analog and one digital, at three expense levels. Don't take these as absolute recommendations. They are rather examples of the types of equipment you might acquire to do your voice recordings. There is no shortage of fine equipment from which to choose.

Radio Shack

Radio Shack features three products that produce voice quality adequate for WBT presentations:

CTR-117 Mono Recorder, about $70

4-channel Stereo Microphone Line Mixer, about $50

Radio Shack Die-Cast microphone, about $35

Believe it or not, this will do the job and provide voice sound that you won't be ashamed of. However, don't use inexpensive Radio Shack cables with it.

Marantz

Marantz manufactures a series of portable cassette recorders (PMD 201, PMD 221, PMD 222, and PMD 430) that radio stations use to do interviews in the field. See the PMD 222 in Figure 17.4. These have built-in filtering that can help produce a clean sound. The following three pieces of equipment will provide you with high quality.

Marantz PMD 201 mono recorder, about $290

Behringer 4-channel professional mixer, about $180

Shure SM58 unidirectional microphone, about $100

This is a superb system for voice. The microphone uses an XLR cable.

Figure 17.4 Marantz PMD 222 voice cassette tape recorder.

Your Computer

You can record directly onto your hard disk. You need the following equipment or something comparable:

Computer with plenty of room left on the hard disk

Good sound card, about $75

Behringer 4-channel professional mixer, about $180

Shure SM58 unidirectional microphone, about $100

This is a digital recorder. You may have a slight problem with portability, but this is a superb digital recorder. The microphone uses an XLR cable and cannot be plugged into a sound card directly.

Digital Recorders

Digital recorders have the capability to produce amazingly noise-free voice recordings. However, slight distortion results in annoying clicks, and a modest amount of distortion results in ugly sounds. Thus, it is very important to set the headroom properly and monitor it carefully (covered later).

Other Recorders

Other recorders are available and might be useful to you, but the examples above are perhaps the most cost-effective:

Reel to Reel Tape Too expensive. Quality not needed.

DAT Tape Expensive and perhaps not as high quality as your computer.

MiniDisk Recordings compressed with slight loss of quality.

CD-R Hard disk is better and more flexible.

Recording

Recording voice is a matter of technical skills (using equipment) and performance skills (managing the performance).

Adjustments

You read the strength of the recording signal on a VU meter or a series of signal lights. When you record (analog), the peak of the signal (when the voice is the loudest) should go occasionally into distortion. Distortion starts at 0. Unbearable distortion (clipping) is usually about +10. The peak signal should register someplace between 0 and +10 but not over +10. This is called *headroom*. This

produces the strongest signal possible without undue distortion. Analog distortion is very forgiving, and this approach works well.

Unfortunately, digital recording cannot bear distortion. It destroys the sound quality. You never want the signal to distort at all. Thus, for digital recording you want to make sure the headroom is between -10 and 0. In other words, the peak signal should never go over 0.

The question is, where do you make the adjustment for the digital signal that you need? At the mixer? At the recorder? At the digital editor (the last resort)? You can make it at any of these adjustment points.

Usually, however, the mixer gives you the most control, particularly over several voices. That's perhaps the best place to make the adjustments for digital headroom. Thus, the normal signal should be at about -10 with the peaks going up to 0 (see Figure 17.5).

These adjustments can be tricky for the following reasons:

1. The mixer usually has a sensitivity (signal level) control for input on each channel.
2. The mixer usually has a volume (signal level) control for output on each channel.
3. The mixer has an overall volume (signal level) control for output.
4. The recorder has a sensitivity control for input.
5. The recorder has a volume (signal level) control for output.
6. The software recorder (audio editor) may have a sensitivity control for input.

Alas, you have to coordinate the adjustments on all of these and make them work with the proper headroom. It takes considerable experimentation. When you get satisfactory settings, you will want

to be sure to note them for future reference. Once you have determined the proper settings, you can use them over and over again.

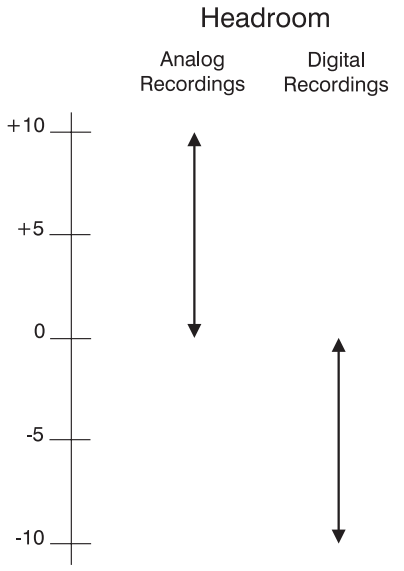

Figure 17.5 Headroom comparison chart.

Tip for Making Adjustments

Start at the mixer end end of the chain of adjustments and work toward the software recorder on your computer.

Where?

Record in a quiet place like a well-carpeted room with the door shut. You don't need a studio. Make sure all fluorescent lights and all appliances are off *including computers*. Plug all your equipment into the same electrical outlet. Air conditioning and heating can cause unacceptable noise. You may have to record when

they're off. If you don't use XLR microphone cables, you may pick up radio signals and record your local disk jockey unexpectedly.

How?

Microphones should be on stands, and the base of the stands should be on pads (mouse pads are great) or carpet. Set up ahead of time and test your equipment. By the time you're ready to record, you should have already figured out your proper adjustments. Set your previously discovered settings on your mixer and recorder, and adjust for individual voices if necessary. Then you're ready to start. Use the *Pause* button on the recorder to start and stop.

Voice Techniques

The most prevalent problem in recording voice is how to make it interesting and hold students' attention. This is a much more difficult problem than the technical aspects of sound recording. Indeed, one person must be a superstar performer to hold students' attention on a cassette tape or CD.

The sole redemption of most cassette tapes and CD offerings is that people listen to them primarily in cars while driving. It is the driving that keeps listeners awake. WBT developers cannot depend on this unusual technique to keep people awake because drivers obviously cannot use mixed media products. The truth is that many solo educational presentations come close to putting people to sleep, even while they drive. What can you do to make educational presentations more interesting?

You can employ several simple but workable techniques to keep students' interest:

1. Always use two people such as a instructor-student or host-expert combination. One person is the expert, and the other

person asks questions or reinforces important points. The performance should be conversational and spontaneous. The interaction between them creates much more interest than a solo presenter can create. The ultimate is a panel discussion directed by a moderator. The panel is populated with experts, and the moderator keeps things moving in the appropriate direction. If you can generate some friendly arguments, a panel discussion can be very compelling.

2. Let an expert make a contemporaneous conversational presentation. Most experts are used to making presentations and don't need a script to do so. (They may need an outline.) They do need some preparation, and they do need to stick to the appropriate topics.
3. Use sound effects as guides to listening. For instance, you can use a special starting sound effect for a voice sidebar and a special ending sound effect as well. That will help the students recognize that such a portion of the sound presentation is a sidebar without having to announce it as such, although you might want to make announcements for reinforcement.
4. Make sound bites short rather than long. Students are less likely to get bored with 3-minute sound bites than with 30-minute sound bites. Certainly, longer sound bites are appropriate for some presentations, but normally you will want to find ways to break up longer voice presentations into smaller sound bites. Keeping the sound bites short is probably the one best technique for solo presenters.
5. Mix the media. When a student is tired of reading, a short sound bite is a welcome relief. When a student is tired of listening, a reading passage is a welcome relief.
6. Record a directed performance in a makeshift studio in preference to a live performance in a classroom or other public

place. You will have more control over both the presentation and the sound quality. But you don't necessarily need a professional studio to make a professional quality recording.

Often, someone who becomes a student in a WBT presentation is motivated to learn, making your job easier. Beware, however, of the situation where you are making WBT presentations for compulsory education or for students who may not be motivated. You may have to try a little harder to keep their attention.

Sometimes recordings are made of lectures and panel discussions without any intent to make use of them other than to put them in archives. There's nothing inappropriate about providing such archives and referring students to them or even incorporating portions of such archives into your WBT presentation. The quality may not be as high as you would like, but if the information is important enough, the students will put up with the lower quality, at least for a while.

Your ace in the hole for making your sound presentations compelling is to use compelling content; that is, content that motivates students to listen. Compelling content can sometimes save a poor presenter.

Radio Station

If you don't want to buy equipment or create a makeshift studio, go to a small radio station to do your recordings. The price will be lower than most professional recording studios, and the quality will be great. This is routine business for radio stations that have to create commercials for their advertisers.

The End of the Line

Recording is the end of the line. Get it right. Don't think you can make a bad recording good in the editing process. It usually won't

work. You can use a digital sound editor (software) to edit the recording and enhance it. But it's difficult to get rid of undesirable noises in the editing process.

Information

Unfortunately, there's not much information on recording voice available in books. You will have to refer to books that feature primarily recording music. Try *Home Recording for Musicians* by Craig Anderton (Amsco Publications, 1996) or *Digital Home Recording*, by Keating and Anderton (Miller Freeman, 1998).

Digitizing

The objective of digitization is to convert analog sound into digital sound. If you have recorded with a digital recorder, however, the objective instead is to get the recording from the digital recorder onto the hard disk of your computer.

Equipment

To record or to get an existing recording into your computer, you need a good sound card (e.g., Soundblaster Live!). The card should have a microphone input and a line input and output. The connectors should match the equipment you use. You also need a fast hard disk. If your computer has a pre-1998 hard disk, it might be too slow to record sound well. If its vintage is later than 1998, it's probably OK. Be sure to defragment your hard disk before recording, and it will record more smoothly.

If you use a digital recorder and want to transfer the digital recording to your hard disk, you will have to have a digital input (connector) on your sound card. This usually costs extra if avail-

able at all. Some digital recorders may use a fiber optic cable and connector. You probably will not be able to find a sound card that has such an input (connector) except in Sony computers.

Microphone Included

Some sound cards come with inexpensive microphones. Where such microphones are engineered to work with the sound card, they may sound much better than one would expect and may be OK for solo voice recordings. Experiment. But remember, you can't go wrong using an expensive high-quality microphone.

Software

Digital sound editors (software) come packaged with sound cards and are otherwise widely available. Usually an inexpensive version (about $50) and a professional version ($300–$500) are available. You need only the inexpensive version unless you want to be an audio engineer.

You use a digital sound editor to both record and edit. Sound Forge editors (*http://www.sonicfoundry.com*) and CoolEdit editors (*http://www.syntrillium.com*) are appropriate for recording voice (see Figure 17.6). These particular programs have a wide range of functions and are the equivalent of expensive hardware edtors. Sound Forge XP comes with an excellent instruction manual. The professional versions of these programs are state-of-the-art audio editors at a small fraction of the cost of comparable top-of-the-line hardware editors.

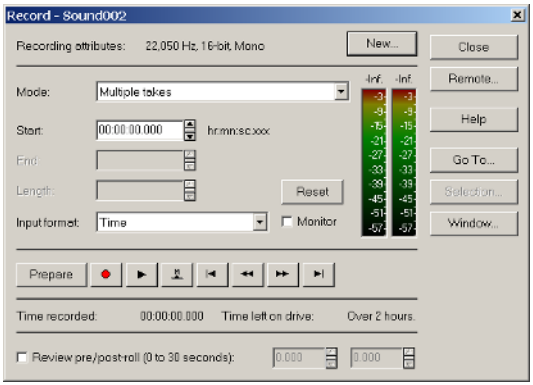

Figure 17.6 Sound Forge XP editor in recording mode.

Procedures

Plug your recorder into your sound card, and you're ready to roll.

If you record direct, plug your microphone into your mixer and your mixer into your sound card, and you're ready to roll. If you have only one microphone, you can potentially eliminate the mixer.

Analog to Digital

To make an analog to digital conversion, you play your analog recording in your analog recorder connected to your sound card. At the same time you record with your digital sound editor (software). The sound card converts the analog signal to a digital signal, and the digital sound editor records it and saves it to the hard disk. It's a slow process and does not go any faster than playing the existing recording.

Sampling and Resolution

You need to set the sampling rate and resolution for recording in your digital sound editor. Resolution is measured in bits. Your choices are 8-bit or 16-bit resolution. Always record at 16 bits. The 8-bit quality is not high enough for voice. And if you record at 16-bits, you can always reduce it to 8-bit later if you need to. You can't increase 8-bit to 16-bit.

The sampling rate is the frequency at which a digital recorder "samples" the sound. The more often, the better the quality. Your choices are 11, 22, and 44 kHz. Do not use any other sampling rates; they may not work with some computer sound systems.

You don't need 44 kHz quality. Record at 22 kHz. Try going down to 11 kHz with your digital sound editor. If it sounds good, use it. If not, stay at 22 kHz.

The higher the quality, the larger the sound file. You don't need the highest quality for voice Web work, but you still need high quality. Don't cut quality just to make sound files smaller. On the other hand, don't use large high-quality sound files that don't sound any better than smaller files.

Digital Transfer

To transfer a digital recording from a digital recorder to your hard disk, you need appropriate transfer software. Since you just transfer a file from one digital device (the recorder) to another (the computer), the transfer takes place quickly.

Direct Digital

With a digital sound editor (software) and an appropriate sound card, you can record digitally directly onto your hard disk. You

will either use a microphone plugged directly into the sound card or a mixer plugged into the sound card.

Using a microphone direct is sometimes difficult. The signal level is not adequate. Some sound cards enable a high sensitivity setting to accommodate microphones and work OK. Others do not. You have more control over the volume (level) of the signal using a mixer. In any event, you have to use a mixer for more than one microphone.

You control the recording by operating the digital sound editor. Most digital sound editors have operational controls that simulate a physical recorder.

Sampling and Resolution

If you use a digital recorder (hardware) to record prior to transferring to your hard disk, you need to set the sampling and resolution in the recording device. Likewise, when you record directly onto your hard disk, you need to set the sampling and resolution in the digital sound editor.

This process can be a little confusing. Figure 17.7 shows the various possibilities. There must be conversion from analog sound to digital sound somewhere in the process. After all, a microphone is an analog device. The one thing you want to avoid is having a digital recording converted to analog and then back to digital just to get it into your computer. Thererfore, keep in mind that transfering a digital recording into your computer from a digital recorder (e.g., DAT recorder) is not a recording process. It's simply a transfer process.

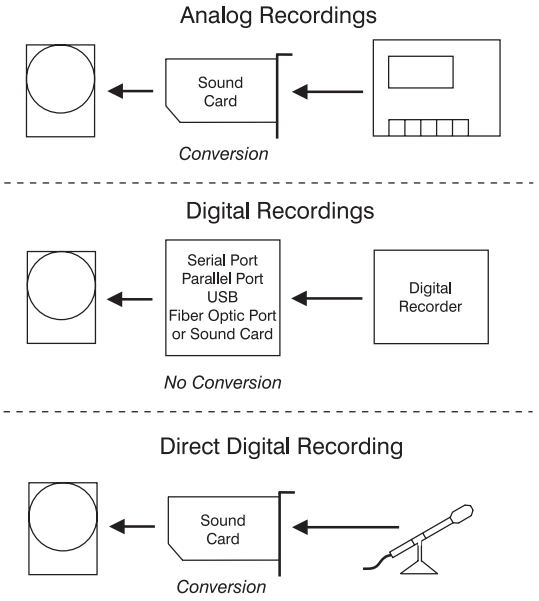

Figure 17.7 Digitization comparison chart.

Windows Volume Control

Always maximize and monitor the Volume Control in Windows (it's part of Windows) when digitizing (recording). Let us repeat that. *Always maximize and monitor the Volume Control in Windows.* If anything goes wrong, it is usually the Volume Control, a poorly designed piece of software. You need to use the Volume Control to turn on and off the specific channels you use to record and adjust the volume on them. Your digital sound editor should take over the Volume Control and operate it for you, but you can't count on anything with this strange piece of Microsoft software. So, keep the Volume Control open and monitor it. If you have a problem, immediately check the Volume Control to make sure the settings are proper.

The Volume Control has two faces: *Playback* and *Recording*. To use the recording controls, you need to display the Recording face. In Windows, go *Start, Programs, Accessories, Multimedia (or Entertainment), Volume Control, Options*, *Properties*, to select *Playback* or *Recording* (see Figure 17.8).

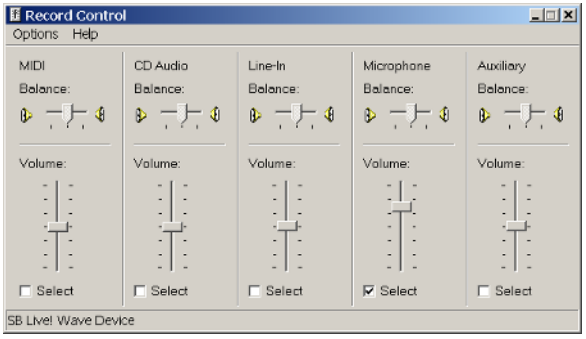

Figure 17.8 Windows Volume Control set for recording.

Don't forget the message of this subsection, or you will be likely to spend extra hours troubleshooting.

No Sound?

It's quite possible to get no sound at all with improper settings for the Windows Volume Control. When there's no sound, check the Volume Control first.

Storage

Storage becomes a potential problem once you start to record. Sound files are large. When you edit them, the editor works on a duplicate copy until the work is saved. It's best to break up long sound passages into shorter ones immediately. It's easier to edit

them, and the editing software corrals less space on your hard disk.

Unless you have a huge hard disk, you will want to move your sound files to a different storage medium. CDs are ideal. Use a CD recorder, and store your sound files on CDs.

Editing

Once you have a recording on your hard disk, you can edit it. You can highlight, cut, and paste just as you can with a word processor. You can copy and paste from another sound file. You can have some fun. But it's slow fun when you listen. The ear is slower than the eye.

The editing process provides you with a chance to eliminate undesirable noises in the recording. Unfortunately, you have to know something about audio engineering to do so. And a more expensive sound editor will work better. Even then you will probably have limited success. It's much better to make a clean recording in the first place than to try to correct a noisy one later in the editing process.

What you can do is enhance the recording to prepare it for publication, and enhancing is easy to do.

Keep in mind that a $50 digital sound editor (software) is the equivalent of a physical sound editor costing tens of thousands of dollars. It's very powerful software yet easy to use for the basics.

DC Offset

This is not a sound enhancement. It's simply something you need to check occasionally. Make sure the DC offset is 0. If it's offset,

correct it. If it seems to be at 0 all the time, you need check it only occasionally.

Equalization

Equalization enables you to change the volume of sound at certain frequencies. If you record someone with a squeaky voice, you can boost the lower frequencies and decrease the upper frequencies to make the voice seem less squeaky.

RealMedia encoding creates a bass effect for recordings. To counteract such a transformation, you can boost the mid and upper frequencies and decrease the lower frequencies before encoding, and RealNetworks recommends that you do so.

You can change equalization in a digital sound editor prior to encoding (see Figure 17.9). If you need to change the equalization of one voice out of several, however, you will have to do it with a mixer that includes equalization capabilities (i.e., a professional mixer).

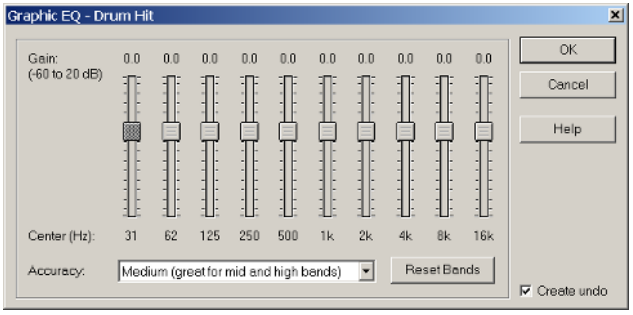

Figure 17.9 Equalization in Sound Forge XP digital sound editor.

Noise Reduction

There are a variety of noise reduction devices enabled by your digital sound editor, and these are beyond the scope of this book. This is the province of an audio engineer, but you may be able to learn how to use them artfully from the manual for your digital sound editor. As mentioned before, your best bet at getting noise-free recordings is to record them that way in the first place, not correct them in the editing process.

Compression

This is not the same as compression for computer files. It reduces the range of sound dynamics, enabling a listener to play at a louder volume without distortion. If applied too heavily, however, it will result in a flat sound. RealNetworks recommends compression before encoding. We recommend proceeding cautiously with compression. Use it lightly, and experiment (see Figure 17.10).

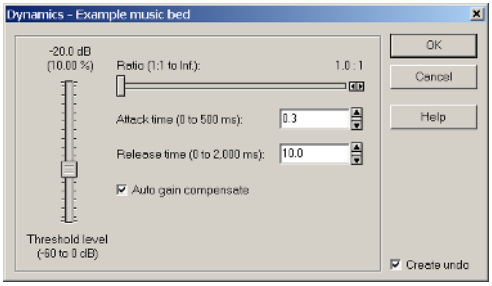

Figure 17.10 Compression in Sound Forge XP.

Normalization

Make this your last step in the sound enhancement process. Normalization boosts the volume to its maximum without distorting

the sound (see Figure 17.11). Normalize at about 95 percent of the normal signal to ensure that there's no distortion.

If you are wondering why we use compression, normalization, and other sound enhancements, remember that the goal is to have a strong signal without distracting noise or distortion.

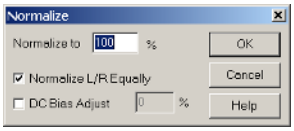

Figure 17.11 Normalization in CoolEdit.

Encoding

Finally, you have a nice voice recording properly enhanced for streaming media. The next step is to encode it for RealMedia using RealProducer (see Figure 17.12).

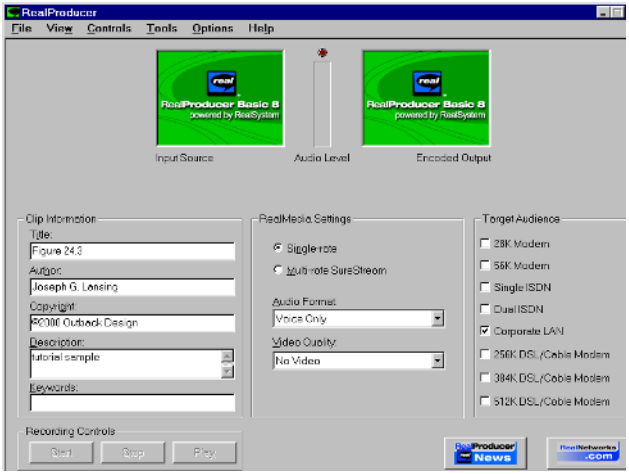

Figure 17.12 RealProducer streaming media encoder.

This is a simple and automatic process. The encoding process transforms the media file into a streaming file and compresses it. You open the media file in RealProducer and go through a few simple steps to complete the encoding process quickly. Of course the longer the recording, the larger the file, and the longer it takes to encode.

Encoding is neither mysterious nor difficult. It's just a simple process to transform normal media files into streaming media files.

The final result is a RealMedia file ready to stream from a Web page. Streaming works well. With a noiseless and distortion-free recording, streaming works quite well.

Embedding

Embedding a RealMedia file in a Web page is unduly complicated but not too terribly difficult. RealMedia files will stream from a Web server but not as well as they do from a RealServer. The following instructions are for RealMedia files streamed by a Web server. (If you have a RealServer on your intranet or at your ISP, you need to embed a little differently than explained here. See the *RealSystems G2 Production Guide* available at the RealNetworks website for more details on embedding.)

<embed>

You use the *<embed>* markup to embed a RealMedia file (*.rm*) in a Wev page. The markup requires three attributes, at least: *src*, *height*, and *width*.

```
<embed src=" http://isphost.com/
media/yourwebsite/music6.rpm"
width="350" height="36">
```

The SRC is the URL of the RPM file. The RPM file is an ASCII text file that lists the URLs of the RealMedia files. The width and height attributes set the dimensions of the display, if any, of the RealMedia. Additional attributes set the appearances and controls of the RealMedia file. See the default controls in Figure 17.13.

Figure 17.13 Default RealMedia controls for audio.

Attribute controls enable you to furnish various control configurations each with specific capabilities. For instance, the following button markups (attributes) yield the following displays:

PlayButton A play/pause button

PlayOnlyButton A play button

PauseButton A pause button

StopButton A stop button

FFCtrl A fast forward button

RWCtrl A rewind button

MuteCtrl A mute button

HomeCtrl The RealSystems logo

Thus, you can set the controls available to students if you have a need to do so. The following show various sliders.

MuteVolume A mute button with a volume slider

VolumeSlider A volume control slider

PositionSlider A media clip position slider

The following attributes control the playback of streaming media.

autostart Set to *true* starts media clip as soon as Web page

downloads. Default is *false*.

loop Set to *true* makes the media clip play continuously, over and over again. Default is *false.*

numloop Enter a number to make the media clip play a certain number of times. Default is *none.*

The <*embed*> markup works for both major Web browsers, but Microsoft favors the <*object*> markup.

RPM

The RPM file to which the SRC in the <*embed*> refers is an ASCII file that lists the URL of the media file. This is a necessary component of the RealMedia streaming system.

```
http://isphost.com/media/mywebsite/
music6.rm
```

The URL above is the RPM file. Without the RPM file, the embedded media will not play.

Streaming Media

RealMedia is used as the example of how streaming media works. Other streaming media systems such as QuickTime and MediaPlayer work in a similar manner. The production, digitizing, and editing processes are the most arduous. If you can master those, encoding for RealMedia, QuickTime, or MediaPlayer will be anticlimatic.

You will need the *RealSystems G2 Producers Guide* to learn the details for using RealMedia. You can find a free copy at the RealNetworks website (*http://realnetworks.com*) in the DevZone (developer's area).

For information on using QuickTime go to the Apple website (*http://www.apple.com*). For information on using MediaPlayer go to the Microsoft website (*http://microsoft.com*), where Microsoft provides a kit for streaming media development.

Using for WBT

You can make RealMedia sound play various ways with various controls:

- Automatically
- Upon an action (e.g., mouse click)
- With full visible controls
- With partial visible controls
- Without visible controls

As mentioned elsewhere in this book, setting the play to automatic is great for first impressions. It can be terrible for subsequent uses because a student has no control and has no choice but to hear the sound bite play again.

Enabling a student to turn the sound on with a click or some other action is much preferable. Once the sound bite is playing, controls for the play can be present for a student. RealMedia enables several levels of visible controls.

Thus, how you will handle RealMedia will depend on what your purpose is in using it. You have some flexibility.

Summary

Streaming voice offers great potential for enhancing your WBT. The production process has a lot of steps but is not unduly compli-

cated. You don't necessarily have to use expensive equipment. Instructors (experts) should be able to make compelling sound recordings without scripting. The digital procedures are straightforward. The entire process is within the grasp of almost any experienced computer user who wants to master it. If your WBT budget doesn't support professional audio engineering, you can do it yourself if you have the time to learn the production steps and make the recordings.

18

Streaming Video

This is not the CBS training camp. We don't claim to be able to teach you how to create entertainment quality video or even network quality video. But we can give you a few basics to help you shoot informational video, if you are so unfortunate as to have to do it yourself instead of having a budget to contract it. Thus, our goal is modest: just the basics.

Videography is a highly technical field, but with basic skills you can shoot usable video clips for educational purposes. Inexpensive

video equipment today has amazingly high quality, and you don't have to make a major financial investment to shoot decent informational footage.

Editing video is tough. Even with the best equipment and software, it's a tedious job. And the best systems still costs a fortune even though prices drop significantly each year. Many people must edit using video editing software on a normal PC. Inexpensive video editing software does not work in real time. The editing must be rendered before reviewing, making the process even more time-consuming. On the other hand, you can edit video inexpensively using just software, which sure beats working with tape.

Real Time

Real time video editing software is now moderately expensive to expensive, but it's not yet inexpensive.

When you're through with your streaming video production, what do you have? You have a small window of video that doesn't even play at full frame rate (30 fps). In fact, you have to have a PC that runs in excess of 1 GHz to play video at full frame rate without a special video card. Most people don't have a special video card, and such cards have never become popular enough to include as standard equipment on a PC. Thus, no matter what the bandwidth, streaming video cannot deliver full frame rate video unless a computer can play it. It seems the agile use of video or streaming video on a PC is still a few years away (as this book went to press in 2001).

Nonetheless, even at a reduced frame rate, video can be a compelling medium. Eventually, you will have to include it in your WBT presentations. Might as well start now and gain some experience.

Takes Two or More

With audio equipment it's possible to be a participant in the educational presentation and run the recorder too. You can be a solo audio engineer, albeit an amateur audio engineer. But this is almost impossible for a video shoot. If you are a participant in the educational presentation, you need a cameraman to manage the video equipment. After all, the camcorder, microphone, and lights must be managed. In fact, cameramen love to have assistance on a video shoot because it's almost too much for one person; and if the production has any complexity at all, it is in fact too much for one person. Thus, you probably cannot do a solo video shoot well and be a participant in the presentation too.

Equipment

The equipment this chapter covers is simple and portable. Today most consumer video equipment will provide a professional-looking image if used properly.

Cables and Connections

The standard three video cables have color-coded connectors. Yellow is for video and red and white are for sound. Don't use the standard cables and connectors if you can avoid it. They are not of sufficient quality to maintain a noise-free image. Instead, use an S-Video cable with its 5-pin connectors (also called Y/C video). S-Video will improve quality and reduce noise considerably.

Noise

Noise for video means random specks appearing and disap-

pearing in the image. It's distracting and can be avoided using S-Video cables and connectors.

For digital video the standard cable and connector that has emerged is IEEE 1394, otherwise known as Firewire.

Proprietary Connections

Proprietary connections (and cables) abound in the camcorder market. If you choose to use one because your camcorder doesn't have a standard connector, you're on your own. It may work fine, but you're better off with a standard connection.

Audio and Video

Video comes with audio. Therefore, all the things you need to do for sound, you need to do for video sound too. That means a separate microphone (don't use the built-in) and possibly even a mixer. Although this hampers the portability of a camcorder, portability isn't a primary necessity for making instructional videos. Camcorders seem to be particularly sensitive to connectors. Make sure you use high quality audio cables and that your connectors between your sound equipment and your camcorder match. Otherwise, you will pick up distracting noise on your sound track.

Microphones

The microphone input on a camcorder is usually a stereo one-eighth-inch minijack. For voice, you don't need stereo. One approach is to use a stereo microphone with a one-eighth-inch minijack. Some available are high quality and can be adjusted to act, in effect, as mono microphones if necessary. Another approach is to use a mono microphone with a minijack.

For a high quality microphone with a balanced cable and XLR connectors, you will need a transformer to turn the XLR connector into a usable jack. An adapter won't work properly. Transformers look like adapters but are different. They cost about $20. Unfortunately, most transformers have a one-fourth-inch jack and won't work with most consumer camcorders. Thus, you will be forced to use an adapter (one-fourth-inch to one-eighth-inch) with the transformer, which may cause noise.

If you use a mixer, you will need a shielded cable with a minijack at one end and a standard one-fourth-inch jack at the other. Do not use connector adapters. They are almost certain to cause noise on your sound track. In addition, most consumer camcorders don't have a line input to handle the line output of a mixer. You will have to turn the volume (output level) down very low on the mixer output to simulate a lower voltage microphone output.

If you are aware of these potential problems, you can avoid them. To make your sound track high quality will require careful selection of equipment and some initial experimentation to make sure you don't pick up noise.

Camcorders

Consumer camcorders are generally high quality, whether analog or digital. For the small difference in price, however, you should opt for a digital camcorder. You will be better able to maintain quality throughout the entire production process.

The preceding information indicates that you need a camcorder with an S-Video connector and an external microphone input. Without these, you are relegated to substandard quality. For a digital camcorder, you need an IEEE 1394 connector.

A discussion of camcorder features is almost irrelevant. A mid- or high-priced consumer camcorder today has the basic features nec-

essary to shoot high quality informational video and can be bought for under $1,000. Nonetheless, look for the following:

- Color viewfinder
- LCD monitor
- Zoom
- Stabilizer
- Auto focus
- Auto exposure
- Manual focus and exposure
- Auto and manual white balance
- External microphone input
- S-Video connector (analog)
- IE 1394 connector (digital)

Analog

Analog video can be confusing because there's no standard. Some of the variations follow. Keep in mind that each camcorder uses only one standard except where noted.

VHS

This uses a full-size VHS cassette. The camcorders are large because they use a normal videocassette. The resolution is 250 lines, the same as television. You can play the cassette tapes in a normal video recorder (VCR).

VHS-C

This uses a VHS minicassette (about 30 minutes). The camcorders are smaller because they use a special smaller cassette. Otherwise they're the same as VHS. You can get a special cassette in which you place the VHS-C cassette in order to play in a VCR.

8mm

This uses a different size tape in a small cassette. The camcorders differ from VHS-C in that they can record much longer. However, to play back the tapes, you need a special VCR, or you will have to use the camcorder itself as a VCR.

S-VHS-C

This is similar to VHS-C except it uses a small cartridge with a special tape and records a sharper image with 400 lines. For playback, you need a special VCR or can use the camcorder itself as a VCR.

Hi8

This uses a special tape in a small cartridge. The camcorders record a sharper image with 400 lines. However, to play back the tapes, you need a special VCR, or you will have to use the camcorder itself as a VCR. Camcorders that use Hi8 tape will also use 8mm tape albeit at a different resolution.

Digital

Digital camcorders are the present and future of consumer videography. Use one in preference to analog video. Make sure it has an external microphone input and an IEEE 1394 connector. The two standards follow. Both standards require a special VCR, or you can use the camcorder itself as a VCR.

MiniDV

This uses a small digital tape cartridge. The camcorders provide 500 lines of resolution.

Digital 8

This uses a Sony 8mm digital tape cartridge not quite as high quality as MiniDV. The Sony camcorders provide 500 lines of resolution and are less expensive than MiniDV.

Ancillary Equipment

Using a camcorder for shooting informational video is not quite as portable as the design of the camcorder would lead one to believe. You need additional equipment that's not quite so movable.

Tripod

One means of substantially improving videography easily is to use a tripod. The tripod should be sturdy and large. It should also pan smoothly.

Lights

Indoors you need to use lights to get adequate color saturation. Buy them at the hardware store (inexpensive) or buy professional lights (more expensive). All the lights need to use the same type of bulb (e.g., incandescent). Don't mix lights (e.g., incandescent with fluorescent). Lights should have reflectors.

Sound

As covered earlier, you will need an external microphone and perhaps other sound equipment.

Professional Equipment

Although consumer camcorders are high quality, professional quality video equipment is better. Reviewing professional video equipment is well beyond the scope of this book. In any event, you need to be a professional videographer to use professional video equipment effectively. Realize, however, that many professional videographers in addition to their professional equipment also use consumer camcorders where portability is a necessity.

Production

Much of the information expressed in the Voice Techniques subsection of Chapter 17 for directing voice is applicable to video. For instance, featuring more than one person on the video will normally generate greater interest than a solo performance. Unscripted performances by experts will be well received on video just as they are for sound. There are other dimensions, though, to shooting video.

Production Techniques

Using video equipment doesn't have to be complicated, but you need to learn a few basic practices that are easy to master. Just a few production techniques will help you to shoot video more efficiently to achieve higher quality.

Lights

Generally, you use three lights (see Figure 18.1). The strongest is aimed at an angle from the front of the subject. The second (weaker) is aimed at the opposite angle from the front. The third is a backlight. It illuminates from behind the subject.

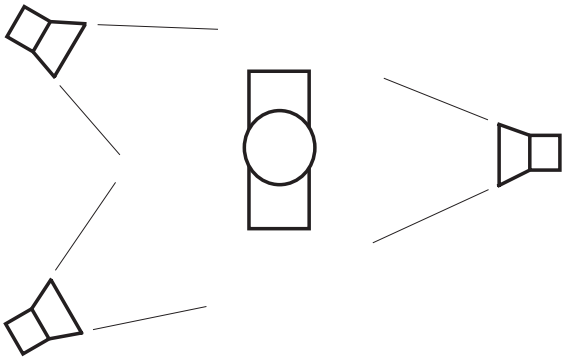

Figure 18.1 Classic lighting for shooting indoor video.

Second Camcorder

If you shoot an informational video such as an instructor lecturing at a podium, you don't generate much interest with a constant-angle view. With a second camcorder, you can shoot from a different angle. In the editing process, you can create a presentation that switches angles from time to time and creates more interest. The alternative to using two camcorders is breaking up the presentation often to move one camcorder.

Microphones

If you don't want the microphones to be obvious in a video, use lavaliere microphones. These are tiny microphones that clip on a lapel or shirt. They are sold in a wide range of qualities. Don't use cheap ones.

White Balance

Light is different colors in different situations such as indoors, outdoors, incandescent, and fluorescent. Most camcorders have auto-

matic white balance, which makes whatever light is available look clear instead of yellow or another color. You need to test a little to make sure the camcorder is doing its white balancing properly. If not, you may have to set the white balance manually.

If you shoot indoors with lights but have sunlight penetrating the room through windows, you have a complex lighting problem on your hands, which may result in an image with an undesirable color cast. You may not be able to resolve the problem without eliminating the sunlight or using advanced lighting techniques.

Viewfinder

Your subject (e.g., an instructor) should fill the viewfinder. Wider views are occasionally appropriate, but most of the time your subject should fill the screen.

Contrast

You cannot accurately accommodate extremes of light and dark and expect to get a good image. Avoid extremes. Use lights to fill in dark spots, if necessary.

Movement

Zooming and panning are adverse to streaming media. You want as little general motion on the screen as possible. Restrict the motion to the subject (e.g., an instructor lecturing against a static background), and the video will stream more smoothly. If you need to pan or zoom, do it very slowly.

Height

Shoot at the same heights as the subject. Other levels are appropriate for short relief views, but shoot at the same height as the subject most of the time.

Angle

As mentioned earlier, using two camcorders to shoot from different angles can enable you to edit a change of angles into your presentation. This creates interest. Never shoot a subject head on. Always shoot from an angle.

You can also use the zoom to change the view (near and far) and thus generate more interest. However, it's tacky to show the actual zooming in the presentation, and it streams poorly too. With two cameras and proper editing, you can change the view without showing the zooming.

Silence

Record a 10-second period of silence before each shooting session. It will make editing easier. Also record a minute or two of silence as a reference for audio background noise.

Repurposing

There is too much existing useful video footage to ignore. Sooner or later you will end up using some for your WBT presentations. This is called repurposing.

To use existing video, digitize it, edit it, encode it, and integrate it into a WBT presentation. Valuable intellectual assets do not necessarily need to be discarded.

Digitizing

Digitizing is the same for video as for sound. Analog video must be converted to digital video in the process. Digital video must merely be transferred to the hard disk.

Equipment

Similarly to digitizing sound, you will need a video capture card and the requisite software to digitize (record) analog video. Make sure the video capture card has an S-Video input. Otherwise, you will have to use normal video cables, and you are likely to have noise in your digitized video recording. Capture software is usually bundled with video capture cards. Video editors, however, can also capture (record) analog video.

If you use a digital camcorder, you don't need a video capture card or software. You need to transfer the digital video to your computer hard disk. To do so, you need a camcorder and a card with IEEE 1394 ports (connectors) and transfer software.

Before you purchase a video capture card or a card with an IEEE 1394 port, make sure that drivers are available for your operating system. These cards sell over a broad price range, and many are designed for special uses. Some are limited in the specific operating systems that they support (e.g., Windows 98 but not Windows 2000).

The speed of your hard disk becomes an issue for processing video. If you have a post-1998 computer, you probably don't need to worry. If you have an older computer, you may find that your hard disk isn't fast enough to record properly.

Procedures

You connect your camcorder to the video capture card via a cable (preferably an S-Video cable). You play the analog videotape in your camcorder. You record using the video capture software on your computer. The video capture card digitizes the analog video as it records. The recording moves along at the speed of the tape, which is to say, slow.

For digital video, you use an IEEE 1394 cable to connect your camcorder to the port card. You run the tape in your camcorder and transfer it to your hard disk using transfer software.

Editing

To edit video on your computer, you need video editing software, which has a range of competency and a range of prices greater than any other software. You also need the fastest computer you can get.

Storage

Digital video takes an enormous amount of space on your hard disk. When you edit video, the editor takes twice the space of the video clip that you edit. Unless you have a huge hard disk, you need to pay attention to the space available.

The best practice is to get the video off your hard disk and onto CDs using a CD-R when you are not using the video. If you have a DVD-R, store your video on a DVD instead of a CD.

Software

You can purchase video editing software for $100 or $10,000 and even more. Usually, an inexpensive video editor will come packaged with a video capture card, but it may not be adequate for serious video work. Adobe Premiere (*http://www.adobe.com*) is a popular video editing program adequate for informational video (see Figure 18.2). The latest version, 6.0, offers real time editing with the proper equipment (special video board). Real time editing enables viewing edits and effects without rendering the file first.

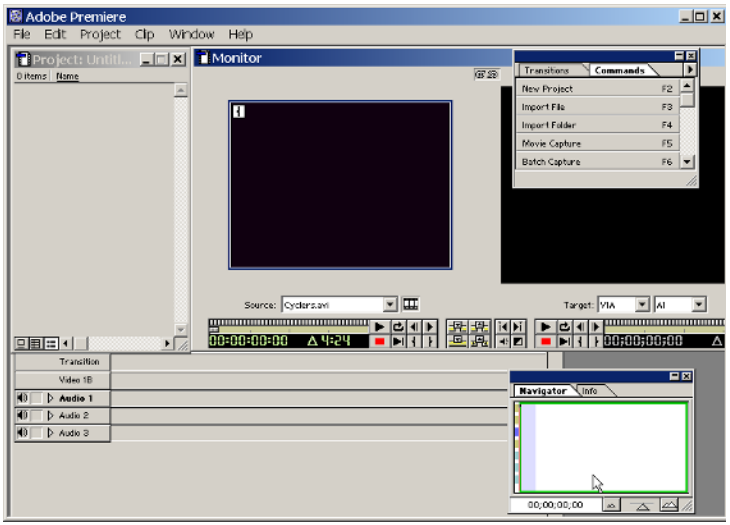

Figure 18.2 Adobe Premiere video editor.

Vegas Video from Sonic Foundry (*http://sonicfoundry.com*) is a relatively new video editing program. It's suitable for basic video in WBT and offers real time editing.

A popular video editor for the Mac is Apple's Final Cut Pro (*http://www.apple.com*). It edits in real time and sells in the upper reaches of the consumer software price range.

Professional video editors edit in real time, and many are hardware-software packages costing tens of thousands of dollars. Avid (*http://www.avid.com*) is the most popular software for professionals.

Editing Video Clips

If you have a long video clip, your best strategy is to break it into smaller clips (smaller video files) for editing. This will usually enable you to edit more efficiently. To edit, you open a video file (video clip) and start editing. You can cut and paste or copy and paste. You can insert or delete sections and even enhance video images.

Use the blur filter lightly for your video clips. It eliminates noise and doesn't affect quality. Terran's Media Cleaner Pro (*http://www.terran.com*) does selective blurring automatically with a noise removal filter, which leaves the video image sharper but also reduces noise.

You will find learning to use a video editor to be time consuming. Likewise, you will find video editing to be time consuming. If you have a limited budget and cannot buy all the video services you would like, a wise place to spend your limited amount of money is on video editing services.

Encoding

Encoding for RealMedia streaming video is the same as for sound bites (review Chapter 17). Use RealProducer, open your video file, and encode. RealProducer encodes from the video clip's normal file format (e.g., an *.avi* file) into a RealMedia file (*.rm*).

Embedding

Embedding a video RealMedia file into a Web page is the same as for a sound RealMedia file. See Chapter 17 for instructions. Keep in mind, however, that the size you set for the embedded video screen has an effect on performance. The larger the screen, the worse the performance, that is, the lower the frame rate and resolution. Use 176 × 132 for your screen, and you will get effective performance.

Distributing

Although a video RealMedia file will stream from a Web server, you need to consider using a RealServer for more than occasional traffic. Streaming video puts a significant load on a server, and special streaming media servers such as RealServer handle the streaming traffic more efficiently.

The issue is not how many students use the streaming video but how many use it *concurrently* (at the same time). For 40 students who need to access the streaming video sometime during the next week, chances are the number of students attempting to access the streaming video at the same time via a Web server will be small; and there will be no problem. For 4,000 students accessing the streaming media sometime during the next week, chances are the concurrent students attempting access the Web server may cause a server load that slows down the system. Nothing is more detrimental to streaming video than an overworked server.

Summary

Streaming video is in its nascent stages now and will erupt into a widely used Web media as soon as most people use PC running over 1 GHz and have wide bandwidth Internet connections. It's not likely that you will produce network or entertainment quality video without a large budget and a professional video production team. Nonetheless, you can produce informational quality video for WBT on a low budget. Carefully woven into a WBT presentation, streaming video can be an attractive enhancement to the training process.

19

SMIL

Simultaneous Multimedia Integration Language (SMIL, pronounced "smile") puts a timeline in the Web. It's a Web standard. To see a SMIL presentation, students must use the RealPlayer. It plays SMIL either in the RealPlayer window itself or in the Web page. For the purposes of this book we will assume the SMIL presentation plays in the Web page.

What does it mean to say SMIL puts a timeline in the Web? It means you can have a dynamic presentation instead of a static

one. You can orchestrate media files (elements) to play at the same time or in sequence and in the same place on the screen or in various places. The media files can be anything from text to video.

An easy-to-understand example is a self-playing slide show. A student starts the slide show (e.g., by clicking on button), and each slide displays on the screen for a certain period after which another slide takes its place. The slide show could be set to music that plays continually while the slides make their appearances, or it could be coordinated with voice commentary.

The WBT Project

For the purpose of illustrating SMIL, we have created a simple tutorial on the ten essentials to carry with you on a hike, including some extras to carry with you on a desert hike. It is a slide show for all practical purposes. The name of the tutorial is Desert Checklist.

Production

The production steps for this tutorial are straightforward. With proper planning, you will not waste your time and will know exactly what media elements you want to obtain or create.

Storyboard

A storyboard is a plan for the presentation (read more about storyboards in Chapter 21). For our example the storyboard is simple. The basic sections of this storyboard are:

Visual:

Music:

Voice:

Comments:

The visual will be either a photograph or graphic image. The music will be background music. The voice will be sequential voice bites. And the comments help the team members or the solo producer remember details about the section.

Rough Storyboard for Desert Checklist

7/7/01

Visual: title.gif, title, 30 sec

Music: none

Voice: none

Comments: title image appears for 10 seconds by itself, enables preloading of media files

Visual: (continue)

Music: back1.rm, background music, 10 sec delay start

Voice: welcome.rm, welcome voice, 20 sec delay start

Comments: background music starts, welcome voice starts after 20 second delay

Visual: backinfo.rm, background info video

Music: stop

Voice: none (except on video)

Comments: background information video starts, background music stops

Visual: pack.jpg, day pack
Music: back2.rm, background music, continues
Voice: listintro.rm, list intro
Comments: background music starts, introduction to list

Visual: list.txt, pack.jpg; list, day pack
Music: (continue)
Voice: none
Comments: items on the list of ten essential for hiking

Visual: item1.jpg, 1st item
Music: (continue)
Voice: item1.rm, 1st item
Comments: 1st item on list

Visual: item2.jpg, 2nd item
Music: (continue)
Voice: item2.rm, 2nd item
Comments: 2nd item on list

Visual: item3.jpg, 3rd item
Music: (continue)
Voice: item3.rm, 3rd item
Comments: 3rd item on list

Visual: item4.jpg, 4th item

Music: (continue)
Voice: item4.rm, 4th item
Comments: 4th item on list

Visual: item5.jpg, 5th item
Music: (continue)
Voice: item5.rm, 5th item
Comments: 5th item on list

Visual: item6.jpg, 6th item
Music: (continue)
Voice: item6.rm, 6th item
Comments: 6th item on list

Visual: item7.jpg, 7th item
Music: (continue)
Voice: item7.rm, 7th item
Comments: 7th item on list

Visual: item8.jpg, 8th item
Music: (continue)
Voice: item8.rm, 8th item
Comments: 8th item on list

Visual: item9.jpg, 9th item
Music: (continue)

Voice: item9.rm, 9th item

Comments: 9th item on list

Visual: item10.jpg, 10th item

Music: (continue)

Voice: item10.rm, 10th item

Comments: 10th item on list

Visual: other.jpg, other items

Music: (continue)

Voice: other.rm, other items

Comments: other items essential to hiking in the desert

Visual: pack.jpg, day pack

Music: (continue)

Voice: close.rm, closing

Comments: presentation closing

Visual: credits.jpg, 20 sec

Music: 10 sec and stop

Voice: none

Comments: close with credits

Asset List

Next you need a list of media files to obtain or create. You develop this as you create the storyboard.

Sound Bites

back1.rm and back2.rm

welcome.rm

listintro.rm

list.rm

item1.rm - item10.rm

other.rm

close.rm

Video Clips

backinfo.rm

Images

title.gif

credits.gif

pack.jpg

item1.jpg - item10.jpg

Text

list.txt

other.txt

You can take this list and quickly make your production schedule and then start producing.

SMIL Coding

Next is the SMIL coding. You can do it by hand or use a SMIL authoring program. Here, we present the code. Please refer to the SMIL tutorial in Appendix III for further understanding or con-

sult the RealSystems *G2 Production Guide* available on the RealNetworks website (*devzone*).

```
<smil><head>

<meta name="author" content="Joseph
T. Sinclair"/>

<meta name="copyright"
content="(c)2001 Joseph T. Sinclair.
All rights reserved."/>

<meta name="title" content="Desert
Checklist"/>

<layout>

<root-layout background-
color="#6699cc" width="600"
height="400"/>

<region id="text" fit="fill"
top="270" left="100" width="320"
height="150" z-index="1"/>

<region id="video" background-
color="#6699cc" fit="fill" top="49"
left="40" width="176" height="132" z-
index="2"/>

<region id="slide" background-
color="#6699cc" top="40" left="360"
width="200" height="150" z-index="3"/
>

</layout>

</head>
```

The meta data in the <*head*> provides authorship information. The <*layout*> section is a little more complex but simply sets forth the area of the screen that the SMIL presentation uses. The root

layout is the overall portion of the screen staked out for the presentation. The individual regions are positioned inside the root layout and designate the location of the visual media elements, in this case images, video, and text. Next the body of the production falls between the <*body*> markups. We put the production inside the <*body*> markups and follow with the closing <*/smil*> markup. Figure 19.1 shows the layout with an image visible.

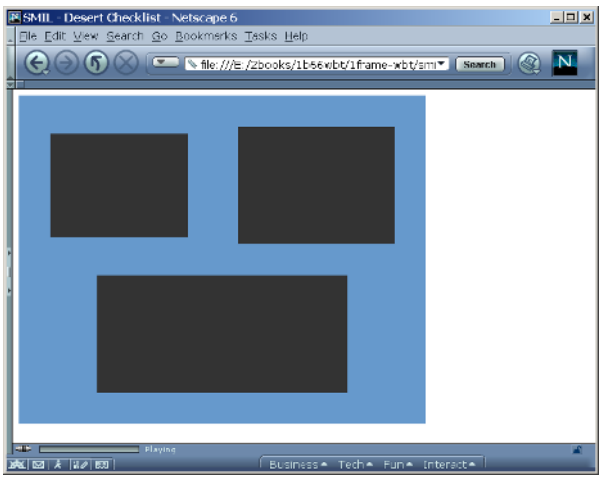

Figure 19.1 Layout for the SMIL presentation (image showing).

The SMIL code for the production follows. Remember that the <*par*> markup indicates that the media play simultaneously while the <*seq*> markup indicates they play in sequence. These markups are straightforward by themselves but sometimes become confusing when you mix them, which you invariably do in a WBT presentation. Since background music will play the entire presentation, set the initial markups as follows.

```
<par>
<audio src="bgmusic.rm"/>
```

```
<seq>
[presentation coding]
</seq>
</par>
```

This simply shows that the background music plays simultaneously with the entire production.

Nesting

Both <*par*> and <*seq*> will nest and also nest inside each other. This enables dozens of different combinations available to suit your purposes.

Modules

Each part of the presentation follows a standard pattern and thus a standard module of SMIL code.

```
<par>
<image src="item1.jpg" dur="20s"
region="slide"/>
<audio src="item1.rm"/>
</par>
```

This shows that each image plays together with a sound bite (i.e., voice presentation). Once, there will be a video clip instead of a sound bite.

At some point, the personification of the production shifts from the storyboard to the actual SMIL presentation. Keep the storyboard active, however, to remain a repository for new ideas.

Creation

Once you have completed your storyboard and have put your code in place, you're ready to obtain or create your media. As you create each image, voice bite, or sound clip, you will know how it fits into the overall production because you have planned well. Naturally, as you get into the production you will make revisions and changes by revising your storyboard appropriately and perhaps even your basic code module. In fact, you can use multiple basic code modules or no modules at all.

There are several SMIL editors and authoring programs available to make your work easier. Some HTML editors even include SMIL editors. Figure 19.2 shows a SMIL presentation.

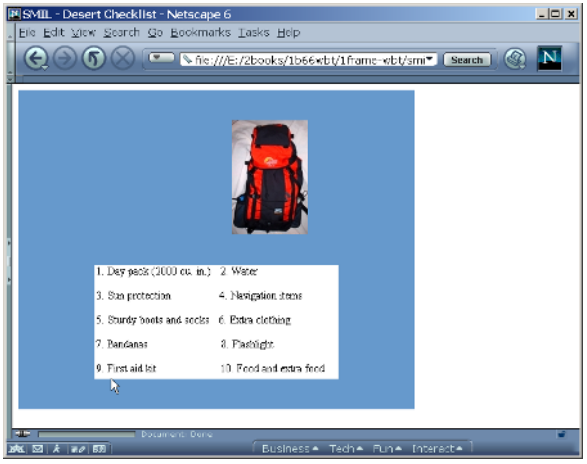

Figure 19.2 SMIL presentation.

Test

As you add the media files, your SMIL presentation starts to take on its life. When you finish adding the files, you can proceed to

test the entire presentation. Testing is more than simply making sure everything plays as it is supposed to play. Much more. This is the place for you to fine-tune your presentation, and you will make a great many timing changes. This final step usually takes more time than you think—occasionally more time than the remainder of the production—and is often tedious work. Timing is everything, and your presentation has to flow smoothly.

Attaching

Believe it or not, setting up the SMIL file and RealMedia files to play properly in a Web page can be unnecessarily complicated and the most difficult part of SMIL development. But it's not that difficult.

The easiest way is to put the SMIL file in the same folder as the Web page in which the SMIL presentation will appear. Let's name the SMIL file *desert.smil*.

You must use a separate file that references the SMIL file, an RPM file. Let's call it *desert.rpm*. Store this also in the same folder as the Web page. The RPM file (an ASCII file) for this SMIL presentation is:

```
file://desert.smil
```

It simply points to the SMIL file. The only thing left to do is embed the SMIL presentation in the Web page in exactly the place where you want it to go. You use the embed markup for that.

```
<embed src="desert.rpm" width="520"
height="420" controls="ImageWindow"
console="one" autostart="true">
```

Note that the width and height must be the same as the root area in the SMIL file. The embed markup SRC attribute refers to the

RPM file, which in turn refers to the SMIL file. The Web browser depends on the RealPlayer to provide streaming services. Thus, the RealPlayer plays the SMIL presentation in the Web page as if it were part of the Web page.

RealServer

The above scheme is for use when your RealMedia files are distributed via a Web server, the most inefficient means of distribution. Such a means is well suited to WBT, however, unless there are an extraordinarily large number of students.

A RealServer distributes RealMedia files more efficiently than a Web server. If you use a RealServer, you must express the URLs for the RealMedia file a little differently, and the set-up can become complicated, as mentioned at the beginning of this section. See the *RealSystem Production Guide* for more information on using RealServers.

As you can see, in the case of SMIL, it takes more than just embedding the SMIL presentation in a Web page. The embedding is indirect. The SMIL file is attached to the Web page, in effect, by the reference in the RPM file.

Entire Presentation?

Can your entire WBT presentation be one SMIL file? Sure. In that case, your presentation might be more like a traditional WBT on a CD; that is, one made with a multimedia authoring program such as Director. On the other hand, perhaps a more balanced approach to SMIL is to use multiple SMIL presentations within a Web-page WBT presentation. When you need to do a dynamic

presentation within your overall WBT presentation, you can rely on SMIL to make it easy to do so.

Summary

SMIL puts a timeline in the Web, and it's a Web standard. It plays via the RealPlayer either in the RealPlayer or in a Web page. It's your opportunity to create dynamic instead of static Web presentations. No need to be a programmer. SMIL is simple, and you can use SMIL editors or authoring programs. Give it a try.

20

Advanced Software

You can choose from much advanced software to facilitate your WBT efforts. Such software ranges from programs that help you manage WBT to programs that build special features within WBT presentations. This chapter covers a few of the most relevant.

Learning Management Systems

Learning Management Systems (LMS) are an outgrowth of training-record databases. Organizations typically keep training requirements and transcripts in a simple spreadsheet or database. As training efforts became more intense, organizations needed more powerful programs to help manage training programs. This resulted in the development of LMS software. Most LMS products have been enterprise versions designed for large organizations. Students access an LMS via the intranet for up-to-date training information.

An LMS is essentially a database. It's modified to handle training management tasks. A list of functions for a typical LMS would include:

Master roster of students

Master course catalog

Class schedules

Training requirements by position

Optional training by position

Training enrollment capability

Search and sort features

Launches WBT

Records WBT completions, scores

Email notification for recurring training

Email notification cancellations

Some advanced Web authoring programs are capable of sending student data to an LMS. This means that when a student completes a test or completes an entire WBT presentation, the Web

page can automatically send the information to the LMS. This simplifies record keeping.

Website Management Software

Website management programs are more than Web page authoring programs or HTML editors. They perform a variety of tasks from file uploading and management to form handling; and they can manage a WBT presentation just as well as a website. The cost of most website management software is priced at consumer levels.

FrontPage 2000

Microsoft (*http://microsoft.com*) offers the website management program FrontPage 2000 (see Figure 20.1).

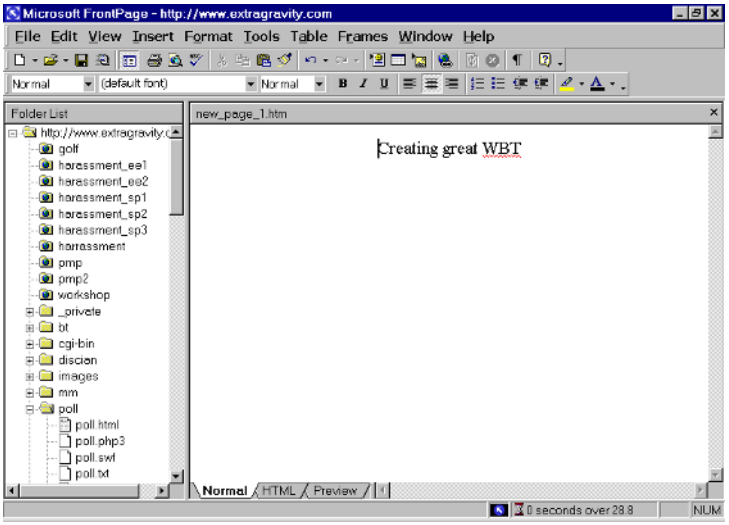

Figure 20.1 FrontPage 2000.

It works in conjunction with software running on the server computer (server extensions) to add functionality to Web pages such as form handling and database applications. (Note: This is not FrontPage Express.)

FrontPage 2000 has a Web-page authoring component much like FrontPage Express. It enables you to add text, images, and other media to your WBT presentations. FrontPage enables developers to include embedded programming (furnished with FrontPage) without the need to do any programming. Microsoft calls these embedded programs webbots. They interact with the server extensions to do their work. (If the Web server doesn't have these extensions installed, the webbots won't work.)

FrontPage 2000 comes with a feature called *themes* to help in the artistic design of websites. Themes can prove useful if your organization is short on graphic design capabilities. When you begin a WBT project, you can select a graphic theme that suits your WBT presentation. After employing it, all design elements will have a uniform look and feel. If your navigation buttons are teal with red trim in chapter one, they will be the same in chapter ten.

WBT developers can work collaboratively with FrontPage 2000. When a file is saved on the website, the file is identified by a *modified by* stamp that lets other developers see who last worked on that particular file. You can assign tasks and track them to monitor progress.

You can incorporate simple navigation bars using FrontPage 2000. The *Shared Border* feature enables a navigation menu to display at a predetermined location (e.g., left border) in every page on the website.

FrontPage 2000 can be a useful program to get your WBT presentation up and running quickly. It lacks some of the features that

other website management software has, but it's a solid management program.

Dreamweaver

Macromedia offers a website management program Dreamweaver, which includes Web page authoring and file management components. It's a real workhorse in the Web development world and recognized as a sophisticated Web design program. With Dreamweaver, you can exercise a high level of control over your Web pages not duplicated by lesser Web authoring programs (see Figure 20.2).

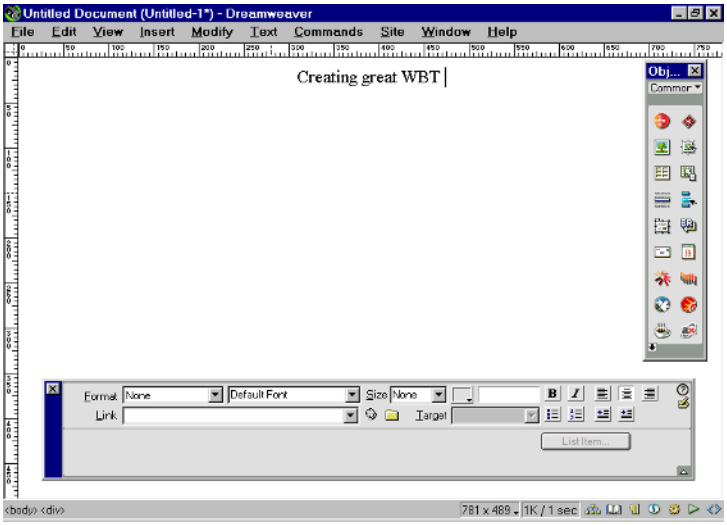

Figure 20.2 Dreamweaver interface (design view).

Dreamweaver enables you to view both the remote website folder tree and local website folder tree simultaneously. A built-in FTP function enables WBT developers to upload or download files. You can automatically upload all newly changed files by using the

Synchronize function. For WBT developers working collaboratively, a file check-out and check-in function can be used to prevent overwriting another's work.

Dreamweaver provides for the easy incorporation of complex Web components. Macromedia's own movies (Flash and Shockwave) are facilitated, and Java applets are also supported.

Cascading Style Sheets (CSS) and Layers are supported by Dreamweaver. Styles can even be assigned to discrete sections of a Web page. You can generate layers through a simple click and drag tool.

Macromedia provides several ways for users to view and edit their Web pages. You can choose from a *Design View*, an *HTML View,* and a *Layout View* optimized for working with Tables and Layers.

Clean Code

Dreamweaver has a reputation for generating clean HTML. This means Dreamweaver's HTML meets the recognized open standards for HTML . Thus, you can be assured it will display correctly in any browser.

Dreamweaver is a top website management program, which provides a lot of functionality for WBT development.

Adobe GoLive

Adobe (*http://adobe.com*) offers a website management program named GoLive. This software competes with Dreamweaver, and choosing between the two can be a tough choice. If you use other Adobe software (e.g., Photoshop, Illustrator), GoLive may be your best choice due to its integration with other Adobe programs.

GoLive enables Web developers to manage all website features from a single point. You can design, edit, fix broken links, or upload new files. A nice feature is its capacity to check how your HTML will be viewed in different browsers.

Editing HTML is easy in GoLive, as it includes a dedicated HTML editor. You can also easily incorporate JavaScript.

GoLive facilitates website design by using a site design view to diagram the flow of your WBT presentation. You can also switch to a layout view for individual Web pages.

Specialty Streaming

Streaming media can be enhanced to deliver multimedia presentations in Microsoft's Internet Explorer browser. In these multimedia presentations, a Windows Media Player is embedded in a Web page. As the streaming media file plays, special code embedded in the stream called *script commands* instructs the browser to load and display Web pages or images. This technology can be used to deliver narrated slide shows, or provide added illustration for streaming video. Imagine a WBT presentation where a video of an instructor plays in a media player while charts, graphs, and other illustrations flip up for viewing.

You embed Script commands in streaming media files at the time you encode them. Special software is required to embed script commands, and there are a variety of programs available. No matter what software is used, the process is straightforward. After a media file is opened the file is displayed on a timeline. Developers select points along the timeline at which to add script commands. Then the file is encoded and saved for use on the Web. Most of these programs even generate the Web pages needed to embed the player and display supporting Web pages.

To get started you may want to try Windows Media On Demand Producer (see Figure 20.3). It is free software available from Microsoft (*http://microsoft.com*).

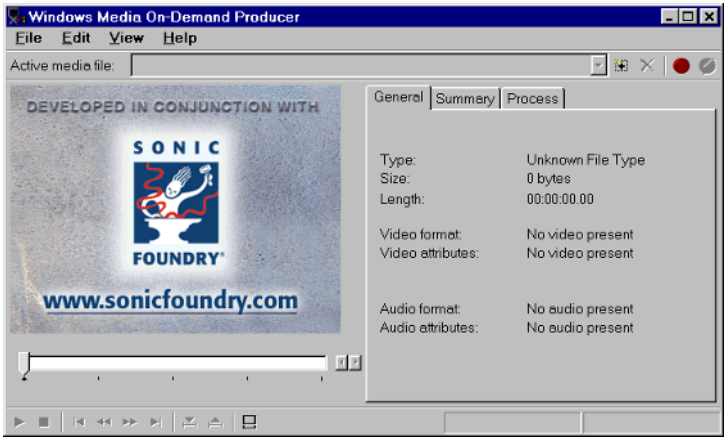

Figure 20.3 On Demand Producer.

The drawback to using On Demand Producer is that it can only encode media for playback in the Windows Media Player. For a better solution developers can use Sonic Foundry's (*http://www.sonicfoundry.com*) Stream Anywhere. This program enables encoding media files for both RealPlayer and Windows Media Player. The user interface is almost identical to On Demand Producer.

Learn Cheap

On Demand Producer was developed jointly by Sonic Foundry and Microsoft. It even carries the Sonic Foundry label. To learn how to develop scripting for streaming media, start with On Demand Producer (for free) and then upgrade to Stream Anywhere.

The Heavyweights

The four programs this section covers came into their own during the heyday of Computer Based Training (CBT), delivered via laserdiscs and CDs. They have evolved to meet the operating conditions of the Web. Use these programs when the WBT project is complex, has a large audience, has a long shelf life, and has a large budget.

The decision to employ one of these powerful authoring programs for your WBT bears careful consideration. The hidden cost of using these programs is the learning required for developers to become proficient using them.

Organizations with dedicated WBT teams may benefit most from using multimedia authoring software of this caliber. You need a team with specialized skills to keep a WBT project on track and on time when using software of this type. A team might be composed of a:

Project manager

Instructional designer

Graphic artist

Web developer

Programmer

The true power of these programs is their capability to deliver custom learning presentations through programming. Your WBT team will benefit greatly if someone on the team has experience programming in C, C++, or Visual Basic.

WBT presentations developed with these programs usually conform to the Aviation Industry CBT Committee/Institute of Electrical and Electronics Engineers Computer Managed Instruction standard (AICC/IEEE CMI Standard). This is important for

interoperability. If student data output from a program follows the standard, then using the data with third-party software is feasible (e.g., LMS software).

Director

A real powerhouse, you can use Director to create almost any multimedia project a creative team can dream up (see Figure 20.4).

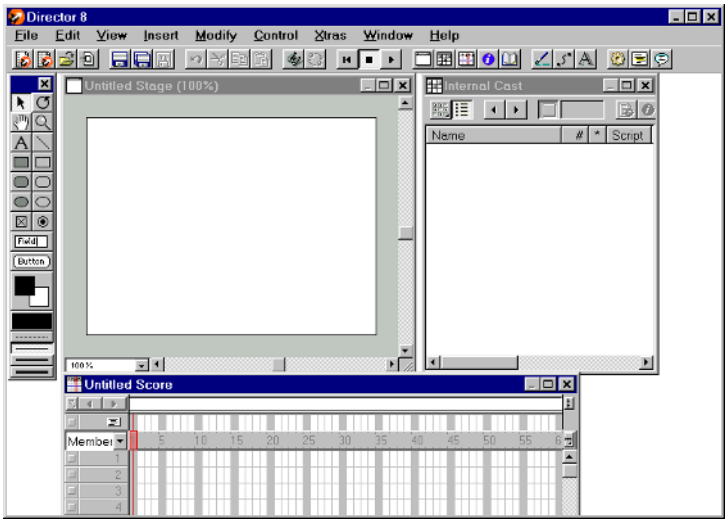

Figure 20.4 Director.

The authoring system relies on the Shockwave player to enable students to view a WBT presentation. The marketing of Director isn't targeted to the training community or WBT developers, but because of its comprehensive approach to multimedia development, it is a program you can easily use to develop WBT presentations. See more details on Shockwave in Chapter 16.

Macromedia supports the development of extensions for many of its programs including Director. Extensions are small add-in pro-

grams. They typically make long programming tasks quick and easy to complete. Most extensions for Director are third-party creations.

To become proficient using Director, you need to learn the scripting language Lingo. Otherwise, you may want to consider using Macromedia's Authorware for WBT.

Authorware

A cousin to Director is Macromedia's Authorware (see Figure 20.5).

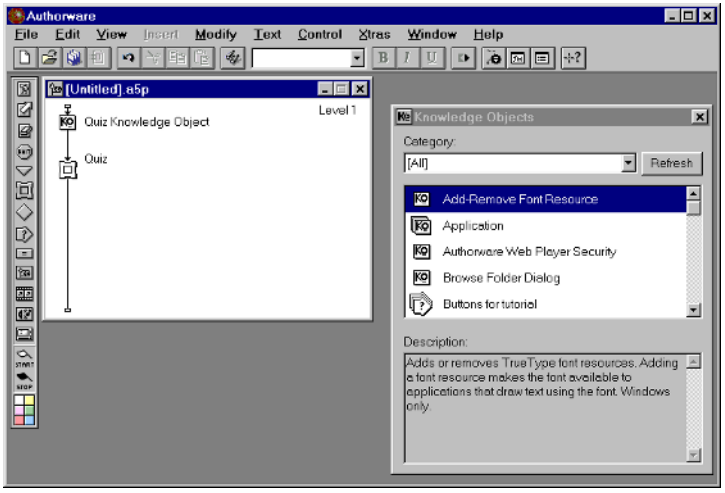

Figure 20.5 Authorware.

It is aimed at the training industry. Macromedia emphasizes that no programming skills are necessary to use this software. You may not need a full development team to create WBT presentations.

Authorware requires students to use the Authorware Player in order to view Authorware presentations. Multimedia support is good for text, images, animation, streaming Shockwave audio, Flash, and QuickTime video.

The real benefit of Authorware for WBT developers comes in specific training features not found in Web management packages like FrontPage 2000 or multimedia development software such as Director. Authorware turns multimedia presentations into effective training. Authorware outputs AICC/IEEE compliant data to ensure interoperability with third-party learning management.

Quest

Mentergy's Quest is a robust multimedia authoring program for training. It requires the Quest Player and browser plug-in to be used on the Web.

Quest enables WBT developer work in a WYSIWYG environment. At any point in the WBT presentation, developers can switch to programming in Quest C (much like C++) rather than use the WYSIWYG interface. Quest provides course templates enabling inexperienced developers to get up and running more quickly.

Data tracking is a strong function of Quest. You can use custom programming to enable Quest WBT presentations to communicate student data to most LMS software. Mentergy, Inc., also sells LMS software named Manager's Edge.

WBT presentations created in Quest 6.0 are limited to Windows 95 or higher. This may be a drawback if you intend your WBT presentation for a public audience. Otherwise Quest is a substantial program for WBT.

ToolBook II

Two useful WBT authoring programs (formerly Asymetrix software) are available from click2learn.com. ToolBook II Assistant and ToolBook II Instructor can be roughly classified as a novice's program (Assistant) and an advanced user's program (Instructor).

ToolBook Assistant helps developers get WBT presentations out the door fast. It is entirely point and click, drag and drop, no programming required. WBT presentations aren't as sophisticated as something developed in ToolBook Instructor or Authorware, but it isn't meant to create WBT masterpieces. Its big brother, ToolBook Instructor, does the masterpieces.

ToolBook Instructor, like Quest or Director, is capable of generating advanced interactivity through the use of a visual programming interface and a proprietary programming language called OpenScript.

Assistant

ToolBook Assistant uses a book metaphor, and WBT presentations are called books. The user interface is very simple. The complex user interfaces of some competing software can be intimidating. By comparison, this makes Assistant appropriate software for beginning WBT developers. Developers drag objects from catalogs into the development area. Objects range from simple text and images to navigation buttons and streaming media. Developers can then modify object properties to suit design needs.

Students need the Asymetrix Neuron browser plug-in in which the WBT presentation is viewed as a native ToolBook book.

Especially useful for WBT presentations are the question objects. Developers can include multiple choice, fill-in-the-blank, true and false, and a few other types of questions. Question scores can safely

be passed to a learning management system using the AICC/IEEE standard.

Assistant comes with many templates useful for beginning WBT developers. You can start with one of the included examples (e.g., sales training) and change it to fit your organization's needs. If you don't need the ultimate WBT, this may be a good choice for you.

Instructor

ToolBook Instructor is a more complicated program than Assistant. It has the features of Assistant and more.

Instructor keeps the ToolBook book metaphor and comes with a nice variety of templates and examples. The real benefit is the visual programming tool, the Actions Editor. You can add sophisticated interactivity using the Actions Editor and ToolBook's programming language, OpenScript.

WBT presentations developed in Instructor can be directly exported to the Web as DHTML and Java. This can speed development but can also limit functionality. WBT developed using OpenScript must be played in a browser with the Asymetrix Neuron browser plug-in.

Data tracking for WBT developed in ToolBook Instructor follows the Advanced Distributed Learning Shareable Course Object Reference Model (ADL SCORM) tracking standard for DHTML courseware. This permits interoperability of student data. All things considered, this is attractive software for WBT.

Summary

This book is about Web-based training. The heavyweight training programs covered in the later half of this chapter, it's true, do play

on the Web via special players. But are they really WBT? In fact, they are holdovers from CBT (computer based training) and the days of laserdiscs and CDs. Using the Web and all its technology standards (e.g., HTML, CSS, SMIL) is easier, less expensive, and just as effective. That's where the website management programs come in.

A WBT presentation is like a website. Consequently, website management programs are well suited to creating WBT efficiently and effectively with less development effort and expense than the old heavyweights.

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21

Designing WBT

Organizations deliver training to improve skills and knowledge in order to achieve organization goals. WBT efforts need to fit within the overall training strategy of an organization. If the design of WBT contradicts the strategy, it will fail no matter how technically proficient or visually engaging it might be.

You need to address several design considerations before your organization employs WBT. This chapter briefly covers these considerations and various WBT design options.

The Creation

The creation of training is a systematic process. If you don't understand the process, the practicalities of developing training will likely induce you to inadvertently go awry.

Process

If you understand the process, you can make your training stronger and more effective. This concept, which applies to conventional training, applies to WBT as well.

Needs Assessment

The first step is to assess the needs of the organization and what must be taught to meet those needs. This provides a basis on which to design the training.

Self-Evident

Sometimes needs are self-evident. For example, if training is required to teach members of the organization a new software system, a needs assessment is not required.

Instructional Design

Next you design the training. You analyze the potential students to ascertain their capabilities; you list and analyze tasks or capabilities that need to be taught; and you write the learning objectives for training. Next select the instructional method best suited to the needs of the organization and students given the learning objectives. It is at this point that you determine whether WBT will be used. Then select the specific WBT devices you will use and create a structure to hold the WBT together.

Development

Next develop the training materials. If WBT is used, include beta testing (i.e., testing the usability of the Web functionality) as part of the development phase.

Delivery

Here it is assumed that if WBT is to be used, delivery will be over an intranet or the Internet. There are plenty of specific issues you need to consider for each. In addition, you can also deliver WBT via CDs or even floppy disks.

Evaluation

Finally, you need to evaluate the effectiveness of the training in meeting the learning objectives. It doesn't make sense to maintain ineffective training. Even if the training is effective, there's always room for improvement.

Cycle

After you have successfully deployed a WBT presentation, you are in a better position to start the process again in regard to the same needs. Thus, the process becomes a cycle (see Figure 21.1). The second edition will likely to be better than the first.

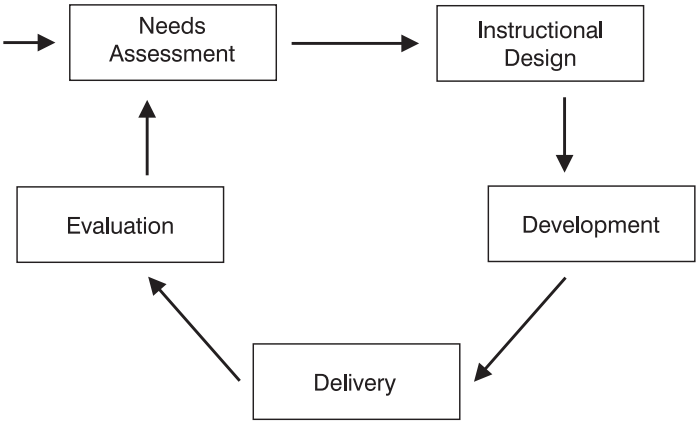

Figure 21.1 WBT cycle (drawing).

Influences on WBT Design

Imagine this scenario: Your supervisor reads an article about a company using WBT to train a staff of 400 sales people in 18 states on new account tracking software. It appears they did it in record time, on their laptop computers from hotel rooms, and after long days of sales calls. Now, your supervisor wants you to develop WBT to train your sales staff the same way. What questions do you have to answer before you proceed to design WBT?

Technical Constraints

What limitations exist in your organization that may limit WBT design? Ideal conditions might look like this:

All potential students have their own computers.

All computers have the requisite hardware.

All computers can connect to a LAN.

The organization's LAN has adequate bandwidth.

All computers have identical operating systems.

All computers have the requisite software.

Computer Access

Making sure each potential student has access to a computer is important. Assess computer deployment and computer access before rolling out a large WBT initiative.

Suppose you want to create a WBT presentation for all employees. Ask questions like, "Do the warehouse workers on the graveyard shift have access to a computer?" and "Do the truck drivers have passwords to access the intranet?" If widespread or universal computer access is not possible, your approach to WBT may have to be scaled back.

Computer Hardware

It is rare in an organization to find that all computers come from the same manufacturer or have the same hardware configuration. If your WBT presentations fall within normal development parameters, you probably won't need to worry about hardware. However, WBT presentations using high-bit-rate sound, video, or such features may require extra memory or even special hardware.

If you intend to use audio or video with sound, check the availability of speakers or headphones for potential students. Nothing will disappoint a student more than clicking into a narrated WBT introduction he or she cannot hear.

The Network

In a perfect world, all computers have high-speed connections to a high-speed network; network traffic is always low; and the IT

department doesn't mind if you take a substantial portion of the available bandwidth for WBT. Thus, you can use unlimited streaming video, large animation files, and huge image files. Students won't ever become impatient with the time required for your media-rich WBT presentations to download.

But the world isn't perfect, and you have to consider three issues: Does every location have computers, how are the computers connected, and how much bandwidth is available for WBT use?

Internet

If you are hosting your WBT presentations with an ISP, the issue of how you utilize bandwidth is simplified. Make the assumption that the general public is capable of connecting at 28Kb. You need to include the lowest common denominator even though many are using high bandwidth cable modems or Digital Subscriber Lines (DSL). If what you need to deliver cannot be delivered effectively at 28Kb (e.g., streaming video), you will have to change your assumption. The higher the assumption, the more people you will leave out. For instance, at 56Kb you will probably leave a lot of people out, but it may not be a significant enough percentage to defeat your offering.

Another approach is to provide different versions of your streaming media. The text and image files in your WBT presentation can remain the same for all students, but enable students to elect low, medium, or high connection speeds. Encode and provide your streaming media files for a variety of bandwidths. Students with a slow dial-up connection can receive streaming audio at 28Kb. Those with a cable modem or DSL line can typically receive streaming media at 256Kb or higher. In a large WBT presentation, it may become cost prohibitive to deliver multiple versions of streaming media files, so budget carefully.

Intranet

Students may use a wide variety of connections to your organization's intranet. A traveling sales force may have laptop computers connecting by 56Kb modems. Branch offices or satellite facilities may use bandwidth connections of 256Kb or less. Major offices and facilities may have 10MB (10,000Kb) connections, but traffic may slow to a crawl during peak-hour usage. It's important that you work closely with your network administrator. He or she can tell you how employees are connected and, more importantly, how much bandwidth is available for WBT. The most likely case is that a limited portion of existing bandwidth is available for WBT. The remainder is intended for business applications like email, file sharing, and database access. Find out what the bandwidth situation is at your organization and design your WBT accordingly.

Operating Systems and Software

Differences in computer operating systems (OS) may make a difference in WBT design. One issue is the platform question: Mac or Windows? If your students have either all Mac or all Windows, there's no issue. If your students have a mix of both, you may run into problems. On the Web, your students will have both, and you will need to conform to open Web standards (see Appendix IV). Many intranets are like the Web; they include both Mac and Windows, and you will need to conform to open Web standards. On an intranet where computers have only one OS, however, you may be faced with using proprietary standards (e.g., Microsoft). That works until you move your WBT to another intranet or to the Web. Suddenly you may experience problems.

If you develop WBT using advanced software that requires special players (e.g., Quest and Quest Player), you may be faced with platform dependency (Quest runs only on Windows). Some special

players (e.g., Shockwave Player) will not work with older versions of Mac or Windows.

Browser versions affect the design of your WBT too. In general, older browsers have fewer capabilities. Although most Internet users have upgraded to Microsoft or Netscape browser versions 4.0 or higher, there remains a small segment of Web users who have not. Earlier browsers are not capable of supporting Cascading Style Sheets, Dynamic HTML, or Java. Even now Microsoft and Netscape browsers exhibit differences in page offset, canvas size, and forms display. If you need to deliver WBT to the general public, it pays to test your WBT thoroughly with a variety of browsers and versions.

The Universal

Although various browsers and versions have different capabilities, the Web browser is still a great universal. Almost everyone has a browser and knows how to use it. You can develop WBT presentations that work in all browsers, or at least most browsers. This creates a universal medium (the Web) over which to deliver your WBT.

The alternative is to go back to the pre-Web days when each CBT program had its own player. Often the players were licensed on a per-user fee, making WBT expensive. There was no common device such as a Web browser with which to deliver CBT presentations.

Thus, in spite of the minor variations between browsers and versions, the browser remains the reason that WBT is desirable and feasible in the first place.

People Constraints

You can develop WBT presentations under ideal technical conditions with the right hardware and software but still fail. Managers, instructional designers, developers, and students are all part of the equation for success.

Management

WBT efforts stand little chance of success unless management has a positive view of WBT and provides adequate support. Examine how management views and supports training in general, and you'll get a hint of how it will support WBT. For instance, did your organization support laserdisc or CD CBT? If so, it will probably support WBT.

Sometimes management is inclined to be supportive of WBT just because it allows employees to take training at a time convenient for business and for the organization.

Accurate budgeting for WBT projects is crucial. WBT developers need to accurately forecast WBT development costs, and management needs to support WBT initiatives with adequate funding. Make every effort to use accurate figures and to keep agreements in regard to WBT projects.

Hidden Danger

Both management and developers need to avoid "scope creep." This is a situation where new content or features creep into a WBT project, making it grow to an unmanageable size. Agree on the scope at the beginning of a project and make every attempt to stick to it.

Instructional Designers

As with all training, the instructional designers complete the needs assessment and design the training. If WBT is the appropriate method to meet the learning objectives, instructional designers must collaborate with Web developers to design effective WBT.

Developers

WBT developers should understand the scope of their capabilities (or that of their development team). Not all developers can program in Java, nor can all developers create SMIL presentations. Not all WBT development teams can produce a presentation incorporating streaming media or CGI testing. WBT developers can take on challenging projects but should not take on impossible ones. One way to do more than your development team is capable of doing is to contract certain tasks to outside third parties. But to do so, you must have a budget to support the costs.

Suppose your development team (or perhaps just you) has good Web page authoring skills and digital art capabilities, but you have no programming capabilities. That doesn't necessarily mean you shouldn't consider programming an interactive quiz in JavaScript or CGI. You can find hundreds of qualified programmers available through various websites ready to work, if you can't find one locally.

Students

The WBT presentation must be a match for your students both intellectually and practically. Even a rough assessment of student computer literacy is a necessary step. If your students use computers infrequently, you will need to compensate for that deficiency in the deployment of your WBT. You may have to provide basic

computer operational instructions first (with WBT or by other means).

Ideally, WBT should present itself to students as a preferable option to alternative methods. If it offers better access (24 × 7) than classroom training and is less disruptive (no travel required), it may have appeal.

If, however, WBT presents itself as a less attractive option, acceptance may be difficult to achieve. Certain topics make a poor fit for WBT presentations. For example, an experienced, live instructor best teaches cardiopulmonary resuscitation (CPR), or tennis.

Developers should work closely with the instructional designer to ensure that the subject matter incorporated into a WBT presentation is suitable for the medium. Looking at the situation from the student's perspective can go a long way toward ensuring success.

Control and Sequence

As a WBT developer, you determine how much control the student has over the learning environment. Unless you are working with a synchronous (instructor controlled) form of WBT, there is no opportunity to quickly change the sequence or depth of content in a WBT presentation. You will predetermine where and how a student interacts with the content. Your indirect control is established by the sequence of content or, in Web terminology, navigation.

One example that illustrates the importance of sequence is the Web itself. You can learn a great deal about many subjects on the Web because of the volume of information present. If you want to learn about Colombian coffee, you easily do so on the Web. Your initial search may point you to a coffee import website where you learn how many tons are shipped to the US each year. Then a link

may take you to a coffee specialty storefront where you learn about coffee grinders. The next may take you to a coffee chain website (e.g., Starbucks) where facts about roasting beans catch your eye. Returning to your initial search, you might select a link to a health-related website publishing medical facts about coffee. You can learn a great deal about coffee via such a Web journey. You have hundreds of options from which to choose and hundreds of directions in which to go. The sequence by which you garner your information about Colombian coffee is highly unstructured. While this sequence may be acceptable for quick research on the Web, it would be impractical for a WBT presentation.

How should WBT presentations sequence content? How many options should be offered to a student? These are questions the WBT developer must answer. How they are answered determines how much control is given to the student.

Let's look at sequence and control in the Meetings WBT presentation we use in this book. In it, we see that it presents the material in logical sequence beginning with an introduction and moving to chapter one, chapter two, and so on. This design leads students through the logical sequence, but does not force them down that path. The navigation menu enables students to go directly to any chapter. If there were content critical to the WBT presentation in chapter one, you could change navigation such that the student had to progress sequentially through the chapters. One way to do this would be to provide links to subsequent chapters only at the end of each preceding one.

Look again at the Meetings WBT presentation and note that links to sidebars are placed contextually. There is no master list of sidebars. Sidebars present students with an option for additional information. Thus, additional control has been given to the student. Reading the sidebar is not required, but students can choose to read it.

Less Control

Developers may want to restrict students to less control in some situations. You may want to require students to read critical instructions or guidelines without an option to bypass them. Certain content is required reading, such as regulatory or policy materials. In these cases, you may want to lead students step-by-step through the content and not provide links to extraneous information.

The right degree of control makes for efficient and effective WBT presentations. Thorough training requires intelligent analysis. You need to examine the subject matter, the students, and the environment to help determine the right degree of control.

Synchronous and Asynchronous WBT

Let's look at *when* WBT takes place. Students can participate when their schedule allows. Some students may participate early in the morning; some may participate late in the evening. This is referred to as *asynchronous* learning. Every student partakes at a different time. When all the students and the instructor participate in WBT at the same time, it's referred to as *synchronous* learning. When WBT takes place synchronously, the instructor can provide immediate feedback to students and modify the training according to need.

Consider that synchronous training takes place in real time and that asynchronous training takes place in convenience time (not in real time).

Asynchronous

Students appreciate the convenience of the asynchronous approach as they can participate according to their schedules and proceed at their own paces. It's convenient. However, students may find asynchronous WBT presentations impersonal without instructor contact. Your organization may find that arranging periodic email contact between students and the instructor can overcome some of the impersonal aspects of an asynchronous WBT presentation.

Another approach to asynchronous learning is to combine it with instructor training. Use the asynchronous WBT as pre-work that students do prior to going to the classroom for instructor training.

The Meetings WBT presentation included in this book is a standard means of delivering asynchronous WBT. The entire presentation is available at any time. Students can work through the whole presentation in one session, or do it over the course of a week or more. It is self-paced. But an instructor can also set the pace for an asynchronous WBT presentation by uploading the chapters one at a time and notifying students when each new chapter is available. A student may not be allowed access to a new chapter until he or she demonstrates competence in the preceding material. Email communication between the instructor and students is very helpful in this form of a WBT presentation.

Synchronous

Simple synchronous WBT presentations are often the most effective. You can develop them and present them in a short time and quickly deliver them. Often they cost only a fraction of what more complex synchronous WBT costs.

One of the simplest techniques is to use a website in conjunction with a telephone conference call. You develop the training content as a WBT presentation created as a website. Then the instructor uses the telephone conference to go through the WBT presentation. The instructor can direct the pace, and students can ask and answer questions. The interaction between students and the instructor is much like a real classroom. The real limitation with this method is in the number of connections your telephone conferencing system allows.

An alternative is to use Web phone software in place of the telephone. Today this works marginally on the Internet (perhaps better on your intranet), but certainly in the future it will work well.

Another option for synchronous WBT presentations is to use Internet video conferencing software such as CUSeeMe (*http://www.cuseeme.com*) or Microsoft NetMeeting. These applications enable multiple users to log in to a special server and set up a virtual conference. Users can share video, voice, whiteboard, chat, and individual files on their respective computers. For WBT purposes, an instructor can contact students by email to arrange a meeting place and time. Students log in using the conferencing software installed on their respective computers. When logged in, they can interact with each other and with the instructor. These conferencing applications have limits on the number of participants, which you will need to consider in your planning.

Video conferencing remains a little crude due to hardware limitations. It will get better in the future as computers come to have with higher operating speeds and people have greater bandwidth.

Webcasts provide another form of synchronous WBT. Live lectures and other training events can be broadcast in real time with special streaming media broadcast software. A webcast takes live video or audio input and encodes it as streaming media on the fly, thus broadcasting it in real time. A live webcast is no small under-

taking but may be the perfect solution for an enterprise-wide event. For webcast software, consider RealNetworks (*http://realnetworks.com*) or Sonic Foundry (*http://www.sonicfoundry.com*). Look for information about hardware at the Winnov website (*http://www.winnov.com*).

Record and Archive

Webcasts can also be used as asynchronous training once they are recorded and archived, as can any live performance or presentation.

If you want to jump into synchronous WBT in a very big way, and have a large budget, you can invest in a virtual synchronous classroom. There are many types and variations available, but most aim to enable students in multiple locations to log in to a central point for instruction. They can share files, view live video clips, share a common whiteboard, or chat. These features are much like those available in NetMeeting or CUSeeME, but virtual classrooms can handle larger numbers of participants. They also have added features that make them feel more like a classroom, such as hand raising, student rosters (see who's in the class), and prompts for the instructor to speed up or slow down. Centra (*http://www.centra.com*) offers popular virtual classroom software, as does Mentergy (*http://www.mentergy.com*).

Keep in mind that effective synchronous WBT is the Holy Grail of WBT. Everyone seeks to duplicate the classroom experience on the Web. This may be misguided. Certainly, a great strength of the Web is the potential for convenient (asynchronous) 24 × 7 training. Take advantage of this strength, at least until Web capability to handle synchronous training improves.

The Team

Simple WBT presentations can be created by one person. As WBT presentations grow in complexity, it makes sense to bring in additional people and form a development team. This usually means enlisting people with specialized skills. The list of specialists is an indication of whom you may require on your team. Your WBT needs will dictate the required mix.

Project manager

Instructional designer

HTML coder

Programmer (e.g., Java, JavaScript)

Database expert

Webmaster

Digital artist

Animator

Audio producer

Video producer

You can bring in many of these to work on a project as third-party contractors.

The Teamwork

The work of the WBT team follows an instructional design cycle. This ensures a high-quality and effective product.

Assessment

Successful WBT presentations result from thorough training needs assessment. You cannot expect WBT presentations to correct performance problems that are better addressed by a nontraining intervention. A good training needs assessment will indicate when training is the correct intervention.

Establish instructional objectives for your WBT presentation based on the needs. Clear instructional objectives are crucial for good WBT design. Regardless of whether WBT is used, it should be clear that all content works to meet the objectives.

Assessment data and instructional objectives will indicate what content you should include. With the ease of publishing content on the Web, it is easy to include too much material. Make certain you include what's necessary to meet the instructional objectives, engage the students, and no more.

Design Devices

Once you have established solid instructional objectives, and everyone has agreed on the content, it comes time to design the instruction.

At this point it is difficult to separate design considerations and development considerations. For instance, if you design for the classroom, your design considerations will be different than if you design for WBT.

Sequence

As a practical approach, first the instuctional designer has to cross the threshold of the design effort by establishing instructional objectives and determining the content. Then a method of delivery must be chosen. (This book assumes that the

method of delivery will include the Web.) Next, the design effort must incorporate that delivery method. At this point, design and development start to overlap.

Instructional designers are normally experienced classroom instructors and can design for the classroom without outside assistance (i.e., from other instructors). In other words, they can normally complete the entire design process by themselves. For WBT, it is often different. Instructional designers are not necessarily experienced Web developers.

Therefore, at this point in the design phase, instructional designers need to team up with the Web developers to create an effective WBT design. Once their collaboration has created the design, the Web developers carry out the development of the WBT presentation.

For instance, instructional designers and Web developers need to collaborate beginning with the use of interim devices such as storyboards. Interim devices can be useful to employ in the design phase, but a storyboard for a classroom presentation is different from a storyboard for a WBT presentation.

Beyond the Scope

This book covers instructional design insofar as it has to do with Web techniques. It does not cover instructional design insofar as it has to do with learning objectives or content. Those are widely covered in books on instructional design.

Storyboard

For a WBT presentation, design a storyboard before you begin developing Web pages. A storyboard is a scene-by-scene (section-by-section) plan for your training presentation. But it is more. In

the animation and motion picture industry, the storyboard is an open plan to which anyone can add ideas. It becomes a creative tool for the design team. Originally, at Disney the storyboard was a series of bulletin boards (on the wall), each representing one scene in an animation film. Anyone could pin anything on the storyboard that represented an idea for the scene: a note, a newspaper clipping, a photograph, a sketch. Even the janitor could pin up an idea. The storyboard was like an ongoing brainstorm.

Today, the storyboard is more likely to be in a computer than on the wall. You can use a storyboard program, but it's not necessary. Many programs lend themselves to being good storyboards. What you need is a program that can be used by every team member and can accommodate additional ideas.

For instance, a word processor (e.g., Word) file might serve such a purpose. Use a Word file for each scene or section of your WBT presentation. Each Word document becomes like a bulletin board and is available publicly. Anyone can add something at the bottom. The ideas accumulate. When the development team meets, it considers all the ideas and decides which to incorporate. Your only problem is how to orchestrate the details of the collaboration, that is, the details of how someone can add an idea to the bottom of the Word document.

Although brainstorming sessions can be productive, an ongoing brainstorm (i.e., a storyboard) has the advantage of capturing ideas as they occur naturally at any time of the day or night.

The brainstorming aspect of a storyboard doesn't take priority over planning decisions. The storyboard should always state for each scene or section the details of the current plan. Only the team or team leader has the authority to incorporate a specific change or additional idea (detail) into the plan. The details of the plan should be sufficient for people to act upon and do their jobs.

But always keep in mind that the storyboard is not the product. The storyboard is the plan, overview, or outline.

If you have a design team, keep your storyboard open to permit your team members to add ideas. If you are developing solo, keep your storyboard open anyway so that you can add new ideas from time to time during the design phase. What better place to accumulate your ideas so that you don't forget them.

The storyboard is an ongoing repository of creative ideas, and it is a plan too. It helps you produce your presentation more coherently and more efficiently with less confusion. For an example of a very simple storyboard that uses only four lines of text per scene, see Chapter 19. Note in the Chapter 19 storyboard, however, that the last line is for comments, which can significantly increase the numbers of lines of text per scene as ideas are expressed or changes suggested.

Note also that the Chapter 19 storyboard is tied directly to the resulting SMIL presentation. On one hand, you might want to keep your instructional design storyboard generic and not tied to any instructional method. On the other hand, for short presentations the design storyboard and the Web page development plan can be merged into one plan.

One-Dimensional Storyboards

In some organizations, the storyboard is the promulgated plan for the WBT presentation. The team leader or manager puts it in one PowerPoint presentation and sends it around for comments. He or she has control of what additional ideas will be added or what parts of the plan will be altered. This is often a one-time process. It is not conducive to much creativity and may even discourage valuable contributions. In addition, because it's practiced as a one-time process, it may preclude new ideas resulting from the actual process of putting together

the presentation. Although theoretically this storyboard is open to ideas, as a practical matter, by not being public and perpetually accessible, it does not accommodate a great deal of participation and creativity.

That is not to say that where a storyboard is nothing but a promulgated plan, the production process allows no flexibility. It's difficult to imagine a WBT project where changes are never made and new ideas are never added after the first promulgated plan. Somehow changes and new ideas creep in. So, why not create a collaborative work environment conducive to creativity, that at the same time provides a more efficient means of accommodating desirable changes and additional ideas? The storyboard is a powerful tool, but it's not so powerful when it's nothing more than a promulgated plan.

PowerPoint itself can be an accommodating program. For instance, if you use one PowerPoint file for each scene or section of your WBT presentation and make it public, team members can add ideas to it by adding screens or instructor notes. The advantage is that it can be projected (on a screen) during a team meeting for discussion. Other than for presentation, however, programs other than PowerPoint may be better suited for storyboards.

Also consider that brainstormed ideas written on Post-It notes during a team meeting can be subsequently entered into a storyboard.

Design Document

For very complex training presentations, you may find it necessary to use other documents in addition to a storyboard. Often these are simply called *design documents*. Training presentations with complex interactivity may benefit from using a well-written design document. If training requires a WBT presentation to include complex navigation, plenty of embedded programming, and links

to other programs such as databases, it pays to use a design document.

A design document lists specifications. It is a merger between general training design considerations and specific WBT features. It describes in detail every feature of the WBT presentation, such as the location of navigation buttons, the color palette to use for 8-bit images, the file-naming convention, and prescriptions for adding unusual Web devices.

Why go to such great lengths to document your work? First, in a complex WBT presentation, it serves as a road map for developers. By working from a design document, everyone on the team agrees to stick to specified standards. Different programmers will use the same naming conventions. Images created by different digital artists will use the same palette. Second, you may not retain the same team members from start to finish. With a design document, a new team member can step right in and get up to speed quickly.

Use your storyboard (and perhaps your design document) as a means of communication with your clients or customers. It can help them see what the WBT presentation will be like long before it's finished. If you or your development team needs approval before full production begins, present your storyboard and design documents to your stakeholders so they can get a better picture of the WBT presentation.

Development and Delivery

Development is the process of implementing the specific Web devices that will make up your WBT presentation and building them into a usable structure.

Development

It is this portion of the training process upon which the entire book focuses. Because this book focuses on development, it does not cover needs assessment, instructional design (of content), or evaluation, except very briefly in this chapter.

Practically Speaking

As a practical matter, it is difficult to separate the design and development phases of training. Certainly the design of training destined for a WBT presentation must take into account the capabilities and shortcomings of the Web medium, just as it must do the same for the classroom if the training is intended for the classroom. At the same time the content must be designed so that it teaches students the appropriate skills or body of knowledge, and the content has little to do with whether it's taught on the Web or in the classroom.

Thus, the design phase focuses initially on the content, and the development phase focuses subsequently on the presentation of the training (e.g., WBT). On the theoretical side, it seems appropriate to keep these two focuses separate. On the practical side, it may be impractical or even inadvisable to do so.

Because WBT is for the Web, the means of delivery is an intranet or the Internet. This book has devoted significant coverage to such delivery but has left plenty for you to work out with your network administrator or host ISP. Thus, the primary focus of this book remains development.

Beta Testing

When you have finished development and your WBT presentation awaits publication on the Web, it is sometimes tempting to release

it untested. After all, you've spent weeks or months working on the Web pages, refining the images, and making the text perfect, right? Alas, you may be too close to the work to see the problems. You need usability testing. Beta testing, carried through by WBT developers using students, tests the usability and functionality of the Web pages in a WBT presentation.

Usability testing means testing your WBT presentation with potential students using the variety of hardware and software for which it was developed. This does not mean beta testing with co-developers. This does not mean beta testing with fellow trainers, teachers, management colleagues, or supervisors. You need to find the deficiencies that real students may encounter with your Web pages and Web devices, and only students are capable of finding such deficiencies.

Usability testing should take place in circumstances as close to WBT training conditions as possible. You should upload the WBT presentation on a host Web server, one that will approximate actual server load and bandwidth constraints (if not the same server that you will actually use). The student beta testers should access the WBT presentation in the location they will use it during actual training (office, home, etc.). Beta testing should always approximate actual working conditions as closely as possible.

Beta testing is most useful when students view or participate in the entire WBT presentation. If conditions dictate that full beta testing is not possible, make certain a representative sample is tested. This means including any introductions, instructions, tests, navigation, embedded programs, or other elements that can present problems for students.

Provide clear instructions to the beta testers. Make certain they know they are expected to be full participants, taking quizzes, reading sidebars, and using all the features in the WBT presentation. If possible, one or more developers should observe beta test-

ing in action. Physical observation of beta testing can reveal confusing instructions, poor navigation, or other flaws that may not be apparent to a developer. Take notes during the observation and discuss pertinent points with the beta testers afterwards to confirm any suspicions.

You may want to use a survey to gather further information about your WBT presentation. Make certain beta testers have viewed or participated in the WBT presentation under actual training circumstances. You need to ask questions such as the following:

Was the navigation easy to use?

Was the organization of the Web pages understandable?

Were the Web devices easy to use?

Was the Web presentation appropriate for the content?

Did the audio sound good?

Did the video appear and play acceptably?

Were the images clear?

Use the information you gather from observation and from surveys to modify your WBT presentation accordingly.

Chapters 10 and 12 will give you some ideas about what you might test to determine usability, but you will need to tailor your usability testing to your own circumstances.

Data from beta testing is invaluable, but remember, you can't please everyone 100 percent of the time. Change your WBT presentation where it makes sense to do so. Then publish it.

Evaluation

After beta testing, you publish the WBT presentation. But the testing is not over. Eventually you evaluate the training for its instruc-

tional effectiveness. This type of testing or evaluation is not beta testing, is separate from beta testing, and is essential to all training whether WBT or not. Evaluation is the responsibility of the instructional designer, not the WBT developer, and as such is beyond the scope of this book.

Pilot Groups

Before publication, you might want to evaluate the WBT presentation with a pilot group (students). The beta testers are, in effect, the first pilot group. Eventually, the evaluation pilot group will be the second pilot group.

Practically Speaking Again

Although theoretically you should have a beta test (Web usability) and eventually an evaluation (instructional effectiveness), as a practical matter, these two are often rolled into one overall evaluation. If so, you need to keep clear in your evaluation exactly what you are evaluating. For instance, the first part of the evaluation might consider Web usability and the second part instructional effectiveness. If you mix everything together in one evaluation, you run the risk of losing focus, and your evaluation may yield results that are not useful to either instructional designers or Web developers.

Maintenance

A WBT presentation cannot be created, released to an audience, and then forgotten. Every WBT presentation needs some form of long-term ownership to ensure it is maintained.

Some WBT presentations may require that someone be available to answer technical questions or questions about the content. This

may or may not be the same person. A Webmaster or other technical person may be the right choice for technical questions. A developer or a subject matter expert may be the right person to answer questions about the content. Email can simplify the process of answering questions. You can provide email links in appropriate places in your WBT presentation.

The content in a WBT presentation may become dated or inaccurate as time goes by. A WBT on work procedures may need updating as new equipment comes into service. A WBT presentation on organizational policies may change as new managers come into office or as new trends in business take hold. The content in such WBT presentations needs someone to look after it and to make necessary changes in a timely manner.

Meta Information

A convenient way to include ownership information in a WBT presentation for the future reference of the training department is through the use of HTML meta tags. Meta tags are HTML code that is hidden from view in the *<head>* of the Web page and may contain data about the authoring program used, a general description, and other information. You will need to use the Edit HTML feature in your authoring program to add a description meta tag like the one below.

```
<meta name="description"
content="This WBT presentation was
authored by the Western Division
Training Department. Contact Bill
Smith for information or questions.
June 30, 2001.">
```

Summary

It's the cycle: (1) needs assessment; (2) instructional design; (3) development; (4) delivery; and (5) evaluation. Then the cycle repeats for the second edition. This is the cycle for all training and therefore applies to WBT. This book focuses on the development and delivery of WBT (3 and 4 above) and also covers the Web techniques portion of instructional design (2), but it leaves needs assessment (1), the learning objectives and content portion of instructional design (2), and evaluation (5) for other books on training.

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VII

WBT Projects

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22

Using XML

"Sooner or later you will have to repurpose your WBT." This is not a sentence you should speak to anyone who's not computer literate, but it's a concern that should cross your mind. Those great Web tutorials you're making might not be the only way you want to distribute the information or knowledge presented. Not everyone has the means or desire to use the Web. Some of your students may want the information in other formats, particularly print. Consequently, you may need to print your tutorial as a pamphlet,

report, booklet, or book. That is, you may need to *repurpose* it to the print medium or another medium.

This raises the issue of the messy and expensive conversions you may have to face. Fortunately, a new Web software technology, XML (Extensible Markup Language), makes repurposing easier. The idea is that when you write your tutorial, you *write once* using structure only to organize text and media elements, not presentation (i.e., not typography). Think of it as plain ASCII text without fancy typesetting but with markups that designate paragraphs, headings, sidebars, and other text structure. XML is similar in this regard to HTML. The only difference is that a Web browser automatically adds style to HTML. Not so for XML. You're the only one who adds the style to XML.

How do you add style? You use a style sheet. For instance, the style sheet might provide your highest level heading (e.g., *h1*) with 20-point bold Garamond type. Without the style sheet, XML displays or prints as plain text (e.g., ASCII text). Thus, by starting with XML, you can make a kernel of a WBT tutorial. With a particular style sheet you can maximize the tutorial for screen display. With another style sheet you can maximize the tutorial for print. When you have to revise your tutorial, you simply do it once in XML. The two style sheets automatically convert your tutorial into the individual media (Web pages and print) with little or no additional work.

The Starting Point

Because XML is always the starting point, a change or revision in an XML document easily ripples out to the various versions in other media (see Figure 22.1).

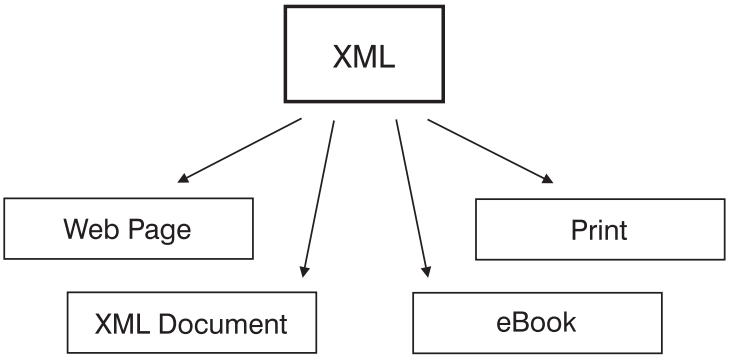

Figure 22.1 Propagation from XML to various media.

How Do I Use XML?

Quite simply. You use an XML authoring program such as SoftQuad XMetaL (*http://www.sq.com*), which is reasonably priced. XMetaL is similar to using a word processor. When you're through typing, however, you have an XML document. Now you're ready to use a style sheet to enable the XML document to flower into an attractive WBT Web page. An XML page can be displayed by Microsoft's 5.0+ Web browser or Netscape's 6.0 Web browser. Use another style sheet, and you can enable a Web print-on-demand document nicely typeset just for print. You can even control pagination with the style sheet.

Then there's HTML. You simply convert the XML document to HTML, if needed. This requires a conversion script (small program), not a style sheet. A better Web system is the new XHTML, which will grow into widespread use soon. Or, convert your XML document to an Open Ebook (OEB) document. The ebook reader will add style and make your XML document into an attractive book-like presentation.

Existing Documents

You can copy and paste text from existing digital documents into an XML document. Some authoring programs even enable you to import other documents (e.g., Word documents) and automatically build an XML document for you.

How Do I Get Started?

The starting point for creating an XML document is to choose or create a Document Type Definition (DTD). This is an ASCII file that defines the structure your XML authoring program will use to create the XML document (i.e., similar to a template). See Figure 22.2.

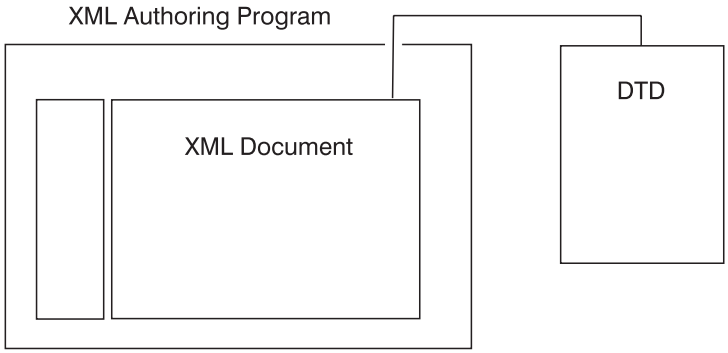

Figure 22.2 The authoring program and the DTD work together to create the XML document.

It makes sense to pick a standard DTD. That increases chances of compatibility with other organizations, other WBT developers, and software vendors. Otherwise, you can create your own DTD to exactly suit your purposes. DTD authoring programs are avail-

able that will help you revise or create DTDs, but it takes a solid understanding of XML to use such programs proficiently.

Standard DTDs

Standard DTDs sound like a good idea. Unfortunately, experience indicates that most users use standard DTDs as a starting point to make their own custom DTDs. Naturally, this saves a lot of work, but it defeats the standardization feature.

Adjusting an existing DTD is not difficult; it's just ASCII text. It's easier than creating a useful DTD from scratch.

Choosing or creating a DTD is an up-front project that takes time and energy. Once done, however, a proper choice should pay off with a streamlined system for handling your WBT projects.

XML Background

XML is a watered down version of SGML (Standard Generalized Markup Language), which is too complex for mere mortals to use. XML DTDs are really SGML DTDs slightly altered. Thus, you can take any SGML DTD and make very minor alterations to convert it to an XML DTD.

It's interesting to note that HTML is a DTD of SGML and XHTML (almost identical to HTML) is a DTD of XML. Thus, you can use the XHTML DTD in an XML authoring program, and your resulting XML document will be an XHTML document (see Table 22.1). In other words, since browsers can read XHTML documents, you can create Web pages via XML without the need to convert from XML to HTML.

Table 22.1 Document Type Definitions for the Web

DTD of	HTML	XHTML
SGML	x	
XML		x

XML is a simplified subset of SGML.

One approach you might consider is using a DTD identical to the OEB structure. This is the lowest-common-denominator approach. Today OEB isn't very robust, but in version 2 it will become more robust, making a publishing system based on OEB feasible. By using the OEB structure, you will be using a standard, keeping your system relatively simple, and easily accommodating all online modes.

What about Print Publishing?

To publish in print, you convert your XML document into the file format of a page layout program such as Quark, PageMaker, InDesign, or FrameMaker. From there you can create Acrobat PDFs, which are widely used by print shops.

This Book

The authors attempted to write this book in XML with XMetaL. Unfortunately, choosing a standard DTD proved to be a real barrier. DocBook is a popular DTD for publishers, but it is a comprehensive, complicated, and overwhelming DTD for novices (370 different markups, about 10 times as many as HTML). The Open Ebook DTD (for ebooks, similar to HTML) has possibilities but really isn't comprehensive enough for print publishing currently. The next version will be more robust.

Most XML experts will tell you that you will end up writing

your own DTD for your own purposes. That appears to be true. With the scope of this book and a deadline to meet, however, the authors elected not to learn how to write their own DTD. Consequently, we reluctantly passed on using XML. Maybe next time.

If this book had been authored in XML—as we hope our next book will be—it would have required a script (conversion program) to convert the XML files into FrameMaker files. Like word processor files, the FrameMaker files are typeset via a template, and then you can convert them to PDFs. Corrections made to the book in XML would require reconversion to FrameMaker and subsequent reconversion to PDFs, a reasonably simple process.

As an alternative, keep in mind that if you design your WBT as Web pages with print in mind, you can deliver readable documents in print, that is, your students can print the Web pages. Thus, if all you need is a Web-page version and a print version of your WBT presentation, a careful Web-page design may satisfy both needs without resorting to the use of XML. The cost of this approach is the compromise built into the design. Web pages and printed pages require different treatments for text (assuming professional designs for each).

What Does the Process Look Like?

Perhaps a graphic best explains how to start with XML and end up with presentations in different media (see Figure 22.3). Using SoftQuad XMetaL for XML authoring and Adobe FrameMaker for print documents, you can repurpose your WBT training presentation to a variety of media while maintaining high quality in each media. (Note that the DocBook DTD may not be your best choice.)

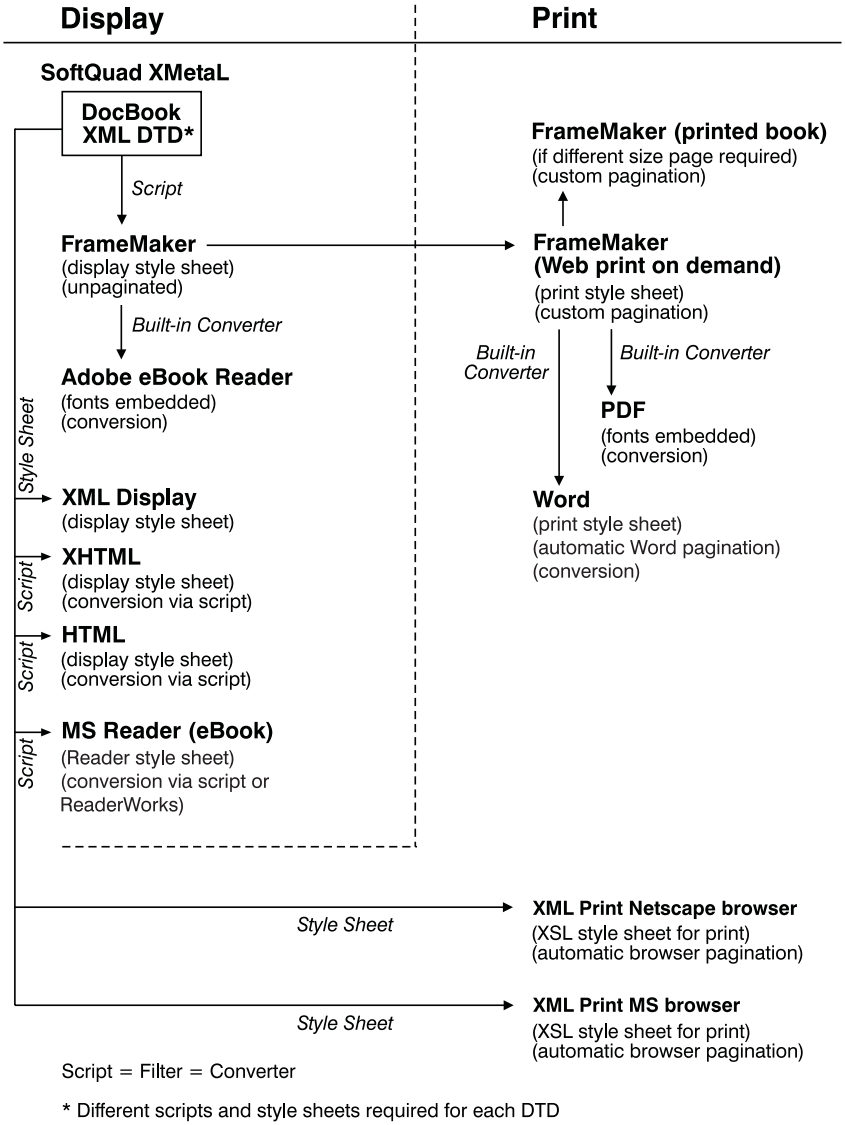

Figure 22.3 XML widely repurposed.